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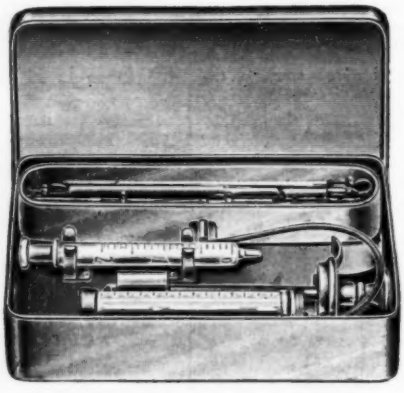

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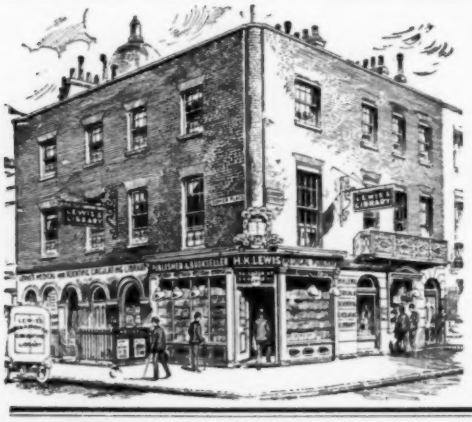

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The Relation
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PARALYSIS AGITANS TO THE PARKINSONIAN SYNDROME OF EPIDEMIC ENCEPHALITIS.

A Lecture delivered in English at the Royal Society of Medicine on the Invitation of London University

BY DR. RENÉ CRUCHET,
PROFESSOR OF PATHOLOGY AND GENERAL THERAPEUTICS IN THE UNIVERSITY OF BORDEAUX.

WHEN in 1917, taking as my basis observations up to 1916 collected while with the army at Commercy, Verdun, Bar-le-Duc, I described for the first time "subacute encephalomyelitis," later to be known as "encephalitis lethargica," I believed it was a new disease. I remarked then the curious polymorphism of the disease, and specially noted several cases in which the immobile face existed from the first. It was already evident to me that the Parkinsonian appearance was in reality quite different from the disease associated with the name of Parkinson.

Later on, after the great outbreak of epidemic encephalitis of the winter 1919–20, certain manifestations, the so-called "Parkinsonian syndrome," were frequently observed. These manifestations were only the continuation of the early Parkinsonianism; others—much more frequent—constituted earlier or later sequelæ of the acute period of epidemic encephalitis. But in both my opinion was not changed, and I considered this so-called "Parkinsonian" condition to be quite different from paralysis agitans. That was the idea which, with H. Verger and Hesnard at the Société de Neurologie de Paris in June, 1921, I tried hard to get accepted. At that time we were almost alone in this opinion: now our conception is commonly admitted.

For that reason we have tried to find out why excellent observers had confounded the "Parkinsonian post-encephalitic syndrome" with paralysis agitans. We found that in these the symptoms which we have isolated under the terms "bradykinetic syndrome" were common to two distinct pathological states, but that in addition to these common symptoms there were others in which these two clinical types were clearly differentiated. On that account we will study, in the first place, the symptoms common to these two clinical types: the "bradykinetic syndrome," and, secondly, we will point out the phenomena particular to each.

BRADYKINETIC SYNDROME.

A syndrome is constituted by the association of several symptoms. The bradykinetic syndrome—as recently studied with Henri Verger in our clinical lectures at the Hospital St. André, Bordeaux[1]—consists in several essential phenomena, of which the most characteristic sign is slowness of movement. The other phenomena are: immobility, fixed attitude, kinesia paradoxa. After considering these we will say a few words on the muscular resistance.

1. *Immobility* is specially remarked in the face which is fixed and expressionless. It is often called the "Parkinsonian mask," although Parkinson has never mentioned it. "Charcot's mask" would be a more exact term. This immobility is found also in all the other parts of the body: there are no longer visible those thousand little movements or tics which are the personal expression of individuality, or underline the course of thought. To the expression of life has succeeded the fixed state of a doll, a mummy, or a waxen image.

2. The *attitude* is equally a fixed one and very characteristic. Generally the body is bent forward, the neck sunk between the shoulders, the trunk stiff, the arms slightly flexed on the forearms, with the hands brought towards the abdomen, the fingers flexed or extended, assuming what has been known as the writing position. Other attitudes are also met with; a lateral inclination to the right or left, an inclination backwards, and others, which vary with each individual. But whatever the attitude may be, one always recognises the condition by the aspect which is fixed, stiff, rigid, or "wooden"—as it is also called. (Fig. 1.)

3. *Slowness of the movements* is the most important sign. That is why we have designated this syndrome as the "bradykinetic syndrome" (of βραδύς, slow, and of κίνησις, movement). The term "bradykinesia" is entirely peculiar to us, and we have used it for the first time in medicine in 1906 in our "Traité des Torticolis Spasmodiques." This slowness of movement is specially striking in the features. The expressions (laughing, astonishment, fear, sadness, attention, &c.) all show a want of spontaneity (Figs. 2 and 3); the slow movement is remarked in speech, opening of the mouth, movements of the lips (as whistling, blowing, &c.), of the tongue, and in mastication and deglutition. All the movements of ordinary life are equally slow. Movements of the head and neck, shoulders, trunk and the limbs, as in walking, sitting down, rising up, stooping, turning, &c., all become stiff and automatic-like.

In acts more complex, as in using the fingers, this bradykinesia is still more noticeable. In drinking, eating, shaving, doing the hair, washing, dressing and undressing, sewing, knitting, rolling a cigarette, folding, writing, playing the piano, &c., patients take a much longer time than they did when in health. The same remarks apply to professional work. We have known electricians, masons, book-keepers, embroiderers, cashiers, typists, &c., who required eight or ten hours for the work they previously did in four or even two hours or less.

It is interesting to particularise the characters of this bradykinesia. The slowness has nothing in common with what one meets with in people naturally slow by birth or temperament. Thus, all these movements seem restricted and stiffened, without the thousand little gestures whose disappearance has already been alluded to in describing the immobility and attitude. For instance, in walking the characteristic automatic movements of the arms are wanting; and in writing or lecturing, eating or drinking, none of the gestures of attention or accompaniment are to be seen. It is important to specify, however, that all these movements are correct and perfectly coördinated, though slow. Then, the beginning of the act is never sudden; it seems delayed and to follow at an interval on the act of will which causes it. The longer the act goes on and the oftener it is repeated it becomes slower and slower in its execution. Then stops, of which the length seems to increase, are observed until complete arrest occurs. At last it happens that the movement which is being executed lasts longer than the will to go on with it. Thus it is that the patient who wishes to stop when walking, or who is suddenly told to stop, goes on, against his will, to make a few steps forwards. In walking backwards or sideways the same happens.

4. *Paradoxical Kinesia.*—The term was used by Souques in 1921, but the condition was known to Parkinson himself in 1817. The phenomenon consists really in this, that certain patients, only able to walk slowly and with difficulty, become at times capable of running. One of the two pathognomonic signs of paralysis agitans, as James Parkinson described it, is here indicated—the festinating gait—that is to say, following his words: "A propensity to bend the trunk forwards, and to pass from a walking to a running pace." These phenomena are classical and met with in all the descriptions, principally in Trousseau and Charcot.

A patient, quoted by Souques, who was incapable of making any movement whatever, could at certain moments cross one knee over the other. Incapable during several hours of answering or answering with a few words five minutes after the question was put to

[1] Henri Verger and René Cruchet: Les Etats Parkinsoniens et le Syndrome Bradykinétique, Paris, 1925.

him, he could, at instants, speak easily. That is another instance to which Parkinson makes allusion when he compares the failure of the will of the patient to effect an arrest of his running to the "volubility," "a similar affection of the speech, when the tongue thus outruns the mind." But these phenomena had passed completely unperceived in post-encephalitic bradykinesia till we in 1920–21 pointed them out for the first time. There is no question in the encephalitis of some limited movements which are always the same; the question is of various complex acts, executed in conditions which astonish the mind and constitute a real *activity of contrast*, of which I will speak later.

5. The four preceding symptoms are sufficient to characterise the bradykinetic syndrome. The study of *muscular resistance* is superfluous. It seems, however, that the authors who have specially described it have been the victims, with Charcot, of a preconceived idea. In considering the appearance of these patients, stiff and rigid and wooden, they have deduced an idea of rigidity; and as if that were not enough, others have made it worse and gone on to speak of hypertonus. Rigidity has come to be thought, since Charcot, the essential element of paralysis agitans. Tremor itself might not be present, and rigidity alone exist; these authors do not hesitate all the same to say that it is Parkinson's disease. Indeed, Parkinson himself would find it impossible to recognise in most descriptions nowadays the disease which bears his name. Tremor, for him pathognomonic, is not thought indispensable, while the rigidity, which he has never mentioned, is regarded as necessary and sufficient.

FIG. 1.

Postencephalitic bradykinetic attitude. Bent backwards, mouth half opened.

I do not hesitate to say that this description of Parkinson's disease is deplorable, because in this particular disease the rigidity is wanting, even when it is looked for. If these authors would take the precaution to tell the patient to remain absolutely passive and to oppose no resistance whatever, they would note that the movements are effected with freedom as in the normal state. If there be a muscular resistance, be it persistent as in lead-pipe, or intermittent as in cog-wheel, it disappears as soon as the first passive movement is ended. When the limb is again at rest, and you want to make it move, this resistance reappears, but disappears again with movement, and so on. Even in typical cases of Parkinson's disease, if it be not too advanced, this so-called rigidity is absent. Thus, the last Parkinsonian case with tremor which I saw some months ago was a man 68 years old; it was enough to put his superior or inferior limbs in complete release, and it was possible to move them in all directions without perceiving the least muscular resistance.

With old cases of Parkinson's disease, evidently, as with certain post-encephalitic bradykinetics, one may observe hypertonus and even the sort of rigidity which recalls the special contracture of spasmodic infantile diplegia; but those are patients ill for a long time. Even in those cases, not even in those of long standing, and often never, rigidity exists such as we have already shown it with Henri Verger.

A FIG. 2. B

C D

The same boy as in Fig. 1 with fixed expressions of the face. A, Serious look with shut mouth. B, Commonly the mouth is open and saliva is trickling out. C, Smiling expression with salivation. D, Laughing, with still more salivation.

Thus reduced to its most simple expression the bradykinetic syndrome is common to a certain number of morbid states, amongst which, without speaking of the Parkinsonian disease and epidemic encephalitis, one may mention certain chronic deforming rheumatic cases, progressive lacunar cerebro-sclerosis, disseminated sclerosis and pseudo-sclerosis, dementia præcox, spasmodic infantile diplegia, chronic chorea, athetosis, chronic myoclonus, and myorhythmia. In 1906 we already showed that bradykinesia can become spasmodic and be associated with certain forms of spasmodic torticollis.

But we will limit our study to the particular characteristic signs which constitute the bradykinetic syndrome, as seen in Parkinsonian disease and in epidemic encephalitis.

PARKINSONIAN BRADYKINESIA.

In Parkinson's original description the characters of bradykinetic syndrome are noted. The study of slowness of movements and of immobility, specially of the face, is, however, not particularly indicated. Has

it been forgotten? Or is it not rather that the enumeration of these phenomena did not seem necessary to the author? As it is a question, following Parkinson, of paralysis, these troubles of the least motor activity, so common and so evident, are they not, by definition, a part of the clinical picture? James Parkinson insists only on the particular evolution of this paralysis; he shows its mode of progression, so different from ordinary paralysis, in which "abolition or diminution of voluntary muscular action takes place suddenly." Here, on the contrary, "the diminution of the influence of the will on the muscles comes on with extreme slowness."

There is a quite singular evolution for a paralysis according to the ideas of that period. Parkinson remarks it expressively. The movements of the face and all movements in general are diminished, "weakened," slackened; are these not evidence of a paralysis? Parkinson finds it needless to speak of it.

To return, two phenomena of a new kind strike him in this paralysis, first of all, and specially, the "shaking"; second, "a propensity to bend the trunk forwards." In this second symptom may be recognised the characteristic attitude of the bradykinetic syndrome. "This propensity to lean forward becomes invincible," as Parkinson says; the result being that the patient, "irresistibly impelled to take much quicker and shorter steps, and thereby to adopt unwillingly a running pace"—substitutes "running for walking," so as not to fall. There we find again the phenomenon of "kinesia paradoxa," already mentioned. And it is natural that it should have attracted the attention of a clinician like Parkinson, little accustomed to see paralytics running.

FIG. 3.

Young bradykinetic woman with the same scale of fixed expressions of the face—serious, smiling, and laughing.

But it is the shaking which gives to the Parkinsonian bradykinesia syndrome its essential and principal character; it is that which is the pathognomonic sign of Parkinson's disease, and so he incorporates it in the definition itself—"shaking palsy." That is why he studies this tremor with such care—an "involuntary tremulous action, in parts, not in action, and even supported." This shaking is the first manifestation of the disease. Most often it begins in one of the hands and arms, and attacks little by little other parts of the body. A sudden change of position, or walking, stops it for a short time. But the time comes when movements are carried out with more difficulty, whilst the tremor becomes incessant and increases in violence. At the same time, in a progressive manner, the trunk is almost permanently bowed; the patient can hardly run or walk any more; he is no longer able to feed himself, he masticates and swallows with difficulty; even the saliva is continually dribbling from the mouth, and ultimately he dies of extreme exhaustion.

Later works on the subject have added little to Parkinson's account; some details have been particularised in describing the shaking—as a movement like that of pill-rolling or cigarette-rolling. Authors have also laid much stress on the agitation, the instability of these patients, who can hardly keep quiet; but Parkinson had already noted this fact in a few words, when he remarked that to calm the incessant tremor which troubled them, "harassed by this tormenting round," as he says, they continually walked.

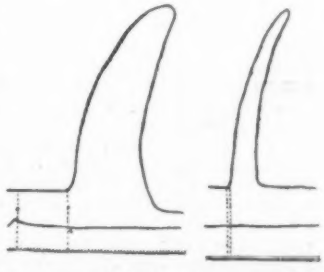
In short, the Parkinsonian bradykinesia is essentially characterised by its insidious onset, at an advanced age, its progressive evolution, its mental state (want of movement, irritability, bad temper); its late salivation, and specially its particular tremor which exists at rest and disappears in voluntary action.

POSTENCEPHALITIC BRADYKINESIA.

The bradykinetic syndrome is here quite complete; the general immobility and impassiveness of the face are striking, especially because we are dealing generally with young people.

The fixed attitudes are equally remarkable, but more varied than in Parkinson's disease, where the bend-forward is especially characteristic.

FIG. 4.



Myogram obtained after an auditory or visual test with a bradykinetic patient. On the curve to the left the reaction-time is longer than in that to the right, which is the curve of a normal man. The distance between the two dotted lines is wider on the bradykinetic than on the normal curve.

Slowness of movement, rather neglected till we described it, has been studied with more precision than with the real Parkinsonian case, on account of the usual absence of tremor. We have noticed the delay in the beginning of movement, then the successive stops till a complete arrest ensues. All these phenomena have been remarked in the acts of ordinary life, and experimentally controlled, on myograms by H. Verger and Hesnard. (Fig. 4.) The modifications of handwriting, with progressive micrographic letters, are well known.

Reading is quite as interesting to study, as we have shown. The patient begins to read in that characteristic dull and monotonous voice; then a sudden stop occurs at the end of the third or fourth line. The eyes are obliged to go rapidly from the end of one line to the beginning of the next, and this movement does not take place immediately. Then it goes on, and reading continues, to stop suddenly again at the end of the line. But little by little, as the reading goes on, the stops are more and more frequent, every two lines, then, every line, and even, in the course of the line, sometimes in the middle of the word. The stops, first of all short, last longer and longer; the voice lowers, and comes to be hardly perceptible, and reading comes to a stop. In acts which require more complex movements, another very curious particularity is noted: it is the stopping of movement in motion, and that in the most uneasy positions. Thus, a spoonful of liquid remains near the lips, held in a sculptural attitude during several minutes; or a draught of milk, or a mouthful of food may remain in the mouth, without being swallowed.

One of my patients, while putting on his trousers, became all at once immobile and bent forward; another, when he wished to pick up something on the floor, bent down, caught the object, and after having lifted it a few centimetres remained for more than a minute in this bent position. Another one, standing, wishing to take his handkerchief from under the pillow of his bed, stretched himself out on it and remained

immobile and fixed during three or four minutes, with the head forward and the hand held out, a few centimetres away from the desired handkerchief. A patient, quoted by Arthur J. Hall, "when brushing the hair, may raise the brush to the head and then progress no further." One sees in these attitudes, the catatonic perseveration, a truly singular phenomenon.

But it is the paradoxical kinesia which is chiefly remarkable. This activity of contrast, however curious, had passed completely unobserved till we called attention to it in 1920 and 1921. We have described several patients, who showed an inert, immobile and fixed aspect, and yet, all the same, at certain moments could play with a ball, or at battledoor and shuttlecock, or go up and down stairs, split wood with an axe, jump close-legged more than one metre high and three metres distance, even carry out evolutions on the horizontal bar. Others continued to motor, to cycle, play football, skip with a rope, to play the piano, violin, or brass instrument. I have seen three who seemed infirm and quite immobile in an armchair and who, all the same, began to dance in my consultation-room.

One of my patients, a brakesman employed in a railway company, at the arrival of the train in the station, came down from his car, shouted the name of the station in passing before every car, and then returned to his post till the next stage. Another, a man cook, whom they were obliged to help to dress and to eat, beat one day an excellent cream, to the great astonishment of those who surrounded him. He and his comrade, the brakesman, were both very skilful at the game with a cork, which consists in throwing down a cork covered with pennies, at 12 metres distance, with a quoit of the dimension of a guinea thrown with the right hand. They knocked down the cork each time, a rare performance for a normal man and all the more extraordinary under the circumstances.

These cases are now very well known. Arthur J. Hall has described how a "fine strong young man, whose immobile face, posture of limbs, and trotting gait are unmistakable, drove a three-ton lorry from Sheffield to London and back in three days, with nobody but a small boy with him. On another occasion, when leaving the out-patient department, he stepped on to the top-rail of the seat and jumped to the ground with the greatest agility." The same author has seen a young man cross the Strand opposite Charing Cross Station, at the busiest time of the day, by waiting for a momentary lull in the traffic, then trotting to the safety stage and stopping himself by clinging to the lamp standard. The second half of the passage was completed in safety, after a long wait, but he could only stop himself by clutching hold of a passing stranger, who thought the man had been taken suddenly ill, and escorted him to the railings. G. L. Thornton has noted that a young man, 29 years old, "in spite of his complaint of weakness in the legs, was able to jump over low obstacles and to run upstairs."[2] Finally, it is hardly necessary to point out the absence of rigidity, even less here than in Parkinson's disease. The clinical examination proves it; but the mere persistence of muscular activity, so considerable as to permit the execution of the preceding acts, would be enough to presume it.

That is for the bradykinetic postencephalitic syndrome.

But other complementary or added symptoms allow of a still better differentiation of the post-encephalitic bradykinesia from the Parkinsonian bradykinesia. These are:—

1. *Tremor.*—The tremor is far from being the rule here, as in Parkinson's disease. It is, indeed, rare. In more than a hundred of my own cases I noted it ten times (one case in ten). Out of these ten cases, in three only did the tremor exist during rest and disappear during voluntary motion (Parkinson's type). In the seven other cases it did not exist during rest, and neither was it intentional, as in disseminated sclerosis. It appeared only in certain positions of fatigue, or else in movements which necessitated an effort, such as to write, to eat, to dress oneself, to shake hands, to carry a weight, &c., in which case its amplitude and intensity grew with the violence of the effort, to cease during complete rest.

A farmer, aged 53, was observed to have the tremor only in one position, evidently tiring: when he carried to his mouth a bowl or plate held with both hands, these were rapidly agitated by the tremor, and the liquid (coffee, milk, or soup) was upset. In the case of a typist, 26 years old, when she was asked to make a rapid movement of flexion of the right forearm on the arm, immediately the forearm began trembling at the speed of about seven jerks per second, with an amplitude from 2 to 8 cm. As soon as the patient changed the position of the limb the tremor ceased. But as these movements took place in many acts of ordinary life, such as eating, drinking, sewing, dressing, &c., it became a great nuisance for this young lady. Another character of this tremor, in distinction to the Parkinsonian shaking, is that it is not at all progressive. Several times we have noted it lessening with time; in three cases it completely disappeared in a few months, without ever coming back.

2. *Mental State.*—In contrast with the Parkinsonian bradykinetic, the postencephalitic bradykinetic patient is calm, peaceable, impassive, does not speak, asks for nothing, is willingly somnolent; he has an invincible repugnance to effort, even to the slightest movement. His greatest desire is to remain absolutely quiet, to have complete rest, rather in bed, where he will readily remain the greatest part of the day. To get up, to dress, even to remain sitting, is for him a fatigue which he would gladly avoid.

His intellectual state seems to slacken concurrently with his physical activity. His ideas are clear, his judgment intact, his memory retained, and his reasoning lucid; but to put his powers in use needs infinitely more time than before his illness. H. Verger and Hesnard have strikingly illustrated this bradypsychia or bradypraxis, or *psychic viscosity.* When these psychical modifications are not too marked, the activity is normal, but sensibly slackened; one would say that the patients have assumed a new personality.

An hotel-keeper, 56 years old, a woman, came to see me in February, 1923. She seemed a stolid person, with an expressionless face, speaking slowly and seldom, but perfectly clearly, her movements quiet and deliberate. She went on managing her business, attending to the cash and accounts. A stranger seeing this woman for the first time might very well have taken her for a person of quiet and reserved manner, calm and slow of speech and temperament, but, in fact, she had become so after encephalitis. Formerly she was a very active woman, always ready to laugh, quick and alert in movement and speech, and prompt in repartee. She knew herself to have changed, and complained of fatigue and lassitude. Indeed, her friends did not know her. Her personality had changed. I have seen other similar instances in my practice. Are they not curious and quite different from the proper Parkinsonian mentality?

3. *Onset.*—In contrast to the beginning of the Parkinsonian bradykinesia, "so slight and nearly imperceptible," writes Parkinson, "that it rarely happens that the patient can form any recollection of the precise period of its commencement," the onset of postencephalitic bradykinesia is nearly always easy to recognise. Somnolence, so-called lethargy, diplopia, frequent agitation with oneirism, even when there is no high fever, symptoms pointing to infectious disease, such as typhoid fever, toxic symptoms simulating botulism, enable us to fix the onset of the disease. The epidemic incidence is important. The greatest number of postencephalitic bradykinetic patients, whom we have observed, have had their attack between November, 1919, and April, 1920.

Age Incidence.—The average is about 60 in Parkinson's disease; the lower the age-period the rarer are the cases. On the contrary, with post-

[2] Brit. Med. Jour., Jan. 3rd, 1925.

encephalitic bradykinesia, the older the age-period the rarer the cases. Even children are frequently attacked—a quarter of the cases in my statistics.

4. *Evolution.*—While Parkinson's disease is fatally progressive, postencephalitic bradykinesia may get better, and even be cured. This depends on whether one deals with the early or the late form. The *early* form, of which I have observed several cases, is pretty often curable. One also often finds a regression or stabilisation at a certain stage, without a real return to the normal state. But most frequently the *late* form is met with. It appears between six months and two years, and sometimes later, after the apparent cure of the disease. In that case, unhappily, prognosis is less favourable. However, it is not necessarily progressive and fatal. I have known patients—for instance, the hotel-keeper of whom I have already spoken—where the illness advanced slowly to a certain stage and then remained stationary. With certain people, I have even noted phases of aggravation followed by phases of regression which finally allowed patients to recover an important part of their social activity. Others, on the contrary, become at length real invalids: incapable of moving, mute, immobile in bed, showing often the limbs fixed in flexion or extension, having even eschars on different parts of the body, and finally become extremely wasted and die.

5. *Other Differential Signs.*—We will pass rapidly in review certain other phenomena which serve to separate postencephalitic bradykinesia from Parkinsonian bradykinesia. Salivation is a very frequent and early sign in encephalitis, while it occurs late in Parkinson's disease. Pupillary troubles (inequality, slowness or loss of reaction to light and accommodation, miosis, mydriasis), exaggeration of knee- and ankle-jerks (without Babinski's sign), various changes in the cerebro-spinal fluid—especially hyperglycorachia—are particular signs of the postencephalitic bradykinesia.

A few words are necessary as to torsion-spasms, which are often met with in postencephalitic cases.

6. *Torsion-Spasms.*—In these different parts of the body assume extraordinary and tormented attitudes. I have quoted several cases, some more curious than others, but principally that of André V., whose detailed story is found in our "Clinics of St. André."

This youth, markedly bradykinetic, ordinarily would be found sitting with the head on the right, his chin on his breast, but the face turned towards the left, so that in order to look straight before him the eyes had to be turned upwards, the eyelids being raised to the utmost. The trunk was bent forward, so that only the middle of the back touched the back of the chair. Then the trunk would be bent little by little to the right side; the back, more and more rounded, would form nearly a right angle with the pelvis, the head and the trunk completely off the seat of the chair. In this incredible attitude, which lasted 10 or 15 seconds, it was astonishing how the patient did not fall; then, with a rather rapid movement he would resume his first attitude. And so on the whole day.

Facts of that sort are really very characteristic. But are they as new as is said? I do not believe so. Most authors consider that the neurosis of tonic torsion (Ziehen), or *dystonia musculorum deformans* (Oppenheim), or torsion spasm (Flatau and Sterling), descriptions which date back to 1910 and 1911, belong to the same clinical family as Wilson's disease or hepato-lenticular degeneration, which, too, was described for the first time in 1911 before the Society of Neurology of London. H. C. Hall (Copenhagen) thinks also that pseudo-sclerosis, studied by Westphal and Strümpell, which is but an atypic variety of disseminated sclerosis, is an analogous pathological state. Finally, neurologists have remarked how much these spasmodic phenomena, when localised, remind one of spasmodic torticollis.

SPASMODIC BRADYKINESIA.

It is only true to say that, in 1906, writing from the clinical point of view alone, and prior to the descriptions given by Ziehen, Oppenheim, Flatau and Sterling, S. A. K. Wilson, and H. C. Hall, we called attention to the same pathological entity, under the name of *spasmodic bradykinesia*—bradykinesia, because the movements were slow; spasmodic, because there were tonic or clonic (rhythmic or arrhythmic) jerks, added to the *bradykinetic phenomena.*[3] Since then I have observed other similar cases of which one, quite typical, occurred in 1907.[4] In short, as we said in 1906 and 1912, we meet with a generalised spasmodic syndrome, causing a rigid, fixed state with stiffness and general slowness of movements. All voluntary acts, whatever they may be, are constrained and slowed: writing, walking, especially going downwards, gestures of the arms, head, and trunk. The execution of movements often exaggerates the spasmodic condition. Frequently, at rest, there are athetotic and choreiform movements of the extremities; muscular instability of all the parts of the body; evidence of vasomotor troubles (sweating or excessive redness of hands, armpits, feet); alterations of speech, which is slow, stammering, and difficult to understand. And we added: "One cannot say that it is chorea, athetosis, paralysis agitans, Little's syndrome, disseminated sclerosis, tabes, Thomson's disease, or spasmodic wry-neck. Without doubt certain symptoms recall some of these diseases, but in themselves they are not sufficient to bring them under any one of these categories. That is why I proposed to name them *spasmodic bradykinesis.*

There is a perfect concordance between the views of these authors and those which we put forward about 20 years ago. Even then we already recognised that these curious states were not the real Parkinson's disease. The discovery of epidemic encephalitis, increasing considerably the number of these bradykinetic forms and their spasmodic varieties, formerly regarded as exceptional, has but confirmed our conceptions. It has allowed us in the meantime to study them better and to observe that the spasmodic state was, in most cases, but secondary, and not essential to the real bradykinetic state. These torsion spasms take place with the *associated forms* which unhappily always complicate, in medicine, the pathological descriptions.

Epidemic encephalitis, more than any other illness, on account of its polymorphism, is predestined to share in this confusion of classification. In our first article of 1917, the earliest to appear on this disease, we had already, founding on our personal observations, shown the diverse clinical forms it could take. We have already indicated the most typical and simple varieties, avoiding the associated forms. It is that same method which has guided us in the statements we have just made.

MORBID HISTOLOGY OF THE BRADYKINETIC SYNDROME.

The morbid histology of acute epidemic encephalitis is to-day well known. The first case, of which the definite histopathology was made out, goes back to April, 1917. It was one of my patients who died in Bar-le-Duc, near Verdun, and my colleague Anglade (Bordeaux) examined the microscopic lesions. He was immediately struck by their resemblance to the histologic lesions of hydrophobia and poliomyelitis in the mesencephalon, both due to filter-passing virus. Now, we find these figured in all the books and, particularly, in the remarkable work of Arthur J. Hall on epidemic encephalitis. I wish here only to consider the lesions connected with the Parkinsonian syndrome. I will not speak of the constant lesions of nerve-cells which are greatly altered in the same manner (reduction, atrophy, destruction), either in the cerebral cortex, hind-brain, grey nuclei, or in pons varolii, peduncles, and anterior horns of the cord. I desire simply to emphasise the curious property of the pyramidal cells to be intensely stained by

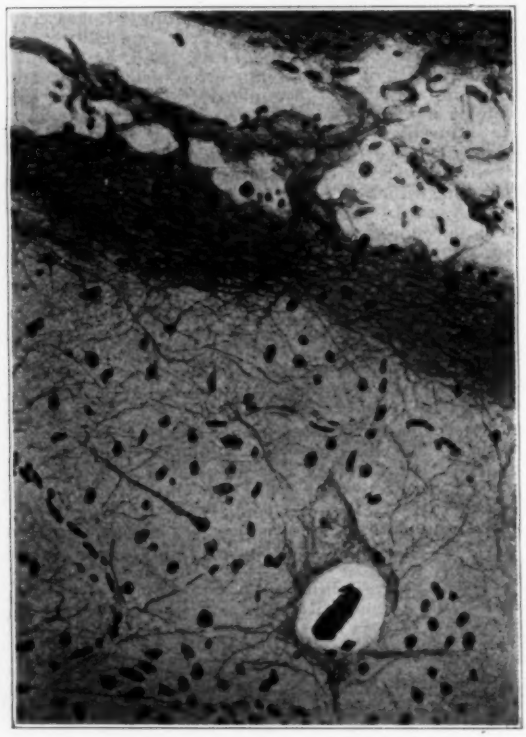
[3] Traité des Torticolis Spasmodiques. Paris. 1907. Pp. 346–394.

[4] Bradykinésie Spasmodique, in La Pratique des Maladies des Enfants. Paris: J. B. Baillière et Fils. 1912. Pp. 377–380.

histological dyes. Also I must add, and it is very important, that the lesions are destructive, insular, unsystematised, and especially marked in the locus niger.

Anglade explains certain forms of Parkinsonian postencephalitic lacunar sclerosis by a neuroglia sclerosis. It is quite an original point of view. In fact, here (Fig. 5) it is not the adventitia of arteries which is involved as it is in the classic lacunar arterio-

FIG. 5.



One can see the glia wall, and in the middle of it, the glia cells and fibrils falling down: that is the first stage of the special Parkinsonian postencephalitic lacunar sclerosis.

sclerosis. The vessel remains intact; but around it the thick wall of glia cuff is losing, little by little, its cellular elements and crumbles away and falls down. Lesions of the locus niger are very intensive, there being almost total destruction of ganglion cells, which are phagocyted by glia cells. The pigment disappears in the substantia nigra and is absorbed by glia cells. Neuroglia fibrils are not very thick, but are always of the *insular* form, which is the chief character of the histopathology of epidemic encephalitis. There are no lacunar lesions in the aqueduct of Sylvius, red nucleus, and locus niger. But, nevertheless, the lesions are very important.

CONCLUSIONS.

We have studied the bradykinetic syndrome in its elementary form; then we have shown that the additions found in the Parkinsonian and post-encephalitic types mark them out as original diseases, perfectly differentiated. From what we know of the diffusion of the encephalitic virus over nervous centres, it is easy to understand that it may give birth in certain cases to the true Parkinsonian type—2 or 3 per cent. in our statistics. But this simple statement shows how rare the syndrome is.

Equally we can well conceive the association of the Parkinsonian and postencephalitic type, as we have seen a few cases. But it is only an associated form, which must necessarily be divided in two essential types, if we will talk about it in a good medical sense. That is why, after all, we always return to consider separately the Parkinsonian and post-encephalitic bradykinesia. We take a firm stand on the sure ground of clinical observation; for anatomical findings, however interesting they may be, do not yet permit us to localise in a certain and definitive way the lesions which cause the bradykinetic syndrome, and the two forms which we have studied.

But this is the true medical method, that of all great doctors in all times and in all countries, the one, in particular, of Sydenham. I do not believe that any better or surer has been discovered. It is that at least which we try to practise in the Bordeaux University.

Croonian Lectures

ON SOME

DISORDERS OF MOTILITY AND OF MUSCLE TONE,

WITH SPECIAL REFERENCE TO THE CORPUS STRIATUM.

Delivered before the Royal College of Physicians of London

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LECTURE IV.

(*Concluded from p. 219.*)

TREMOR.

BY comparison with chorea and athetosis, tremor is a motor derangement of a vastly simpler character. It may be defined as a succession of similar movements at equal intervals—more precisely, as a more or less regular, rhythmical, alternating contraction of a muscular group or groups and their antagonists. This definition, however, is not as precise as it appears, for the clinician encounters very fine and quick tremors, felt rather than seen, in which the alternation is difficult to determine, while other rhythmical conditions are much more elaborate than ordinary tremor, and others still closely resemble the latter superficially yet have a different origin. Various complex alternating movements of an "involuntary" sort have been grouped by the French under the term of "rhythmias," but this, of course, is more descriptive than definitive. For the purposes of this section, attention will be confined to tremors whose organic origin is matter of general acceptance.

CLINICAL CHARACTERS OF ORGANIC TREMOR.

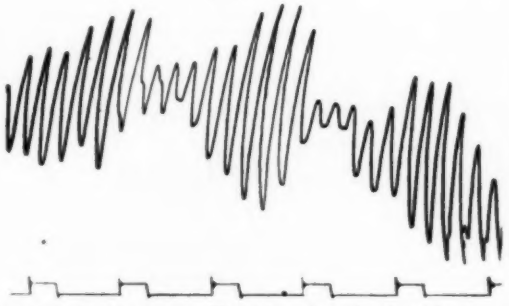
(1) *Rate.*—Doubtless some tremors are slower than others, yet the rate of the periodic muscular contraction is fairly constant, averaging from four or five to seven or eight a second. This rate is not apparently a function of the length of the muscles concerned, for careful measurements in cases, say of paralysis agitans, will as a rule give the same figure for short muscles such as the interossei or other small hand muscles and for larger ones such as those of the neck or trunk. Tremors of wide excursion are not of necessity slower; if anything, they are sometimes rather faster than tremors of narrow limits. From a study of numerous examples of striatal disease the average rate is six a second, as near as may be. This rate is found to vary within very moderate limits at the instance of factors both of an extrinsic and an intrinsic kind.

(2) *Range.*—Every intervening grade from the finest range to a coarse and wide movement may be met with; and in the same patient the excursion often varies from time to time, sometimes in a regular,

sometimes in a highly irregular way. Fig. 33 taken from a case of postencephalitic Parkinsonism (unilateral) exhibits this range variation clearly, and a fair degree of regularity in the variation. Irregularity of range excursion is seen in Fig. 34 (also from a postencephalitic case).

(3) *Rhythm.*—On the whole, the majority of organic tremors exhibit a rhythm from which they depart but rarely; the tremor is set in such and such a way, and modification seldom occurs. The rhythm of the hand movement in the Parkinsonian from whom the tracing of Fig. 35 was secured is almost mechanical in its perfection. Fig. 36 represents another Parkinsonian tremor, of equally clock-like rhythm but of variable amplitude.

FIG. 33.



Tremor in Parkinsonism. Variation of amplitude with a certain regularity.

(4) *Localisation.*—While theoretically any set of skeletal muscles and its opposite group may be seized upon by tremor, from the lips, or the fingers, to the trunk, the small muscles of the body are more particularly its seat. A mere catalogue of tremor localisations would serve no useful purpose; what is of greater interest is the curious way in which tremor will shift its incidence in a moment from one group to another. I have noticed this particularly in cases of progressive lenticular degeneration, but it is a feature also of not a few cases of paralysis agitans. For example, a flexor-extensor tremor at the wrist will change to one of a side-to-side character (radial-ulnar deviation), or give way to one of pronation-supination, and so forth. Again, it sometimes will migrate in a still more extended fashion, leaving the arm, or its distal segments, to pass to the head or trunk, or to the opposite side of the body. The records reproduced in Figs. 37 and 38 are from a case of progressive lenticular degeneration with a pronounced tendency of this kind for the tremor to "wander." Within a second or two of placing the tambours in position for a record of a wrist flexion-extension tremor it shifted its incidence to the pronator-supinator mechanism, but returned a few seconds later to the original group, with reduced amplitude (Fig. 37). On another occasion (Fig. 38) a rhythmical and seemingly unvarying pronator-supinator tremor altered its character as soon as the tracing started, and eventually left the group altogether, passing to the biceps-triceps combination.

This variability or fluidity of distribution is suggestive not of a fixed structural disorder so much as of a morbid process or state prone to develop itself in such and such a muscular combination as a sequel to the interjection of some additional factor, the nature of which will be discussed a little later.

A more remarkable illustration of this fluctuation is provided by a phenomenon which I have now observed some four times in cases of unilateral Parkinsonism, in each instance following epidemic encephalitis. The particulars of one case may be given.

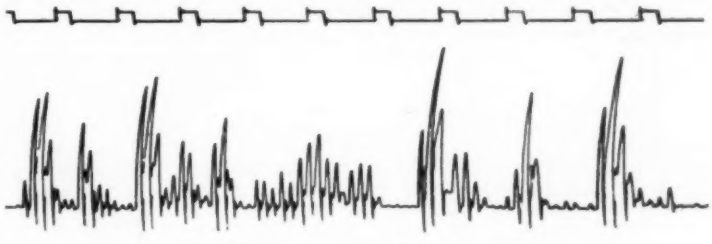
It was that of a youth of 19, with left-sided Parkinsonism of a fairly severe character; his left hand and arm exhibited a typical rhythmical tremor which became particularly noticeable if the limb was unsupported, e.g., held out in front; support at all the joints either reduced it materially or caused it to disappear. On the right (normal) side was no sign of pyramidal or extrapyramidal disturbance. The right arm could be held out by itself with absolute steadiness. Now, when *both* arms were outstretched the left at once exhibited marked rhythmical tremor of flexion-extension at the wrist, and invariably, a second or two later, the right outstretched and unsupported (normal) hand went into a similar but finer tremor. Support applied to the left limb cut short its tremor, and within two or three seconds the fine right tremor would then disappear (Fig. 39).

Thus a limb in every objective respect apparently normal developed a tremor whenever its fellow of the opposite side, rather severely involved in Parkinsonism, developed tremor; its tremor followed on the appearance of the Parkinsonian tremor, and ceased with cessation of the latter, yet both beginning and end always occurred a second or two later in the case of the former. Its range was much finer, but its rate and other characters were identical. This phenomenon is of considerable interest, furnishing, as it does, additional proof of the fluidity of many organic tremors—a feature to be taken into account in respect of pathogenesis.

CONDITIONS INFLUENCING TREMOR.

We should derive a false notion of organic tremor if we contrasted it only with the known changeableness of so-called "functional" tremors, imagining change to be typical of the latter and fixity of the former. Numerous "functional" tremors vary in minimal degree, while organic tremors can be and are influenced by a whole series of factors, as will now be exemplified. When the back of the hand of a Parkinsonian patient whose tremor is in full swing is momentarily pricked with a needle the tremor may cease for many seconds. Fig. 40 is the tracing from such a case; at the arrow signal the dorsum of the moving hand was pricked for a moment and in this instance something like ten seconds elapsed ere it recommenced. (The crescendo character of this Parkinsonian tremor should be noted; the point is referred to below.) In a similar case of finer tremor the cessation thus produced lasted only for a second or two. In still another case, of rather irregular tremor (Parkinsonian), the cutaneous stimulus effected a transient interruption, followed, however, almost immediately by an exaggeration of the movement.

FIG. 34.

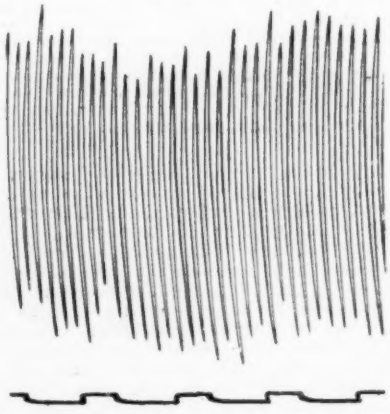


Parkinsonian tremor. Highly irregular amplitude.

Other forms of extrinsic excitation may produce an effect. At the arrow signal in Fig. 41 (idiopathic paralysis agitans) the sudden loud bursting of a paper bag filled with air caused no more than the briefest disturbance of the rhythmical tremor, but sometimes the effect has been more pronounced. Stimuli of an emotional sort may or may not have their influence; attention in this respect is a disturbing factor. I have always obtained better

results in the maintenance of tremor for recording purposes when the subject's eyes have been closed, to exclude visual stimuli. Not a few patients discover for themselves means of checking the involuntary movement, if only for a time. One of my patients could at once cause his tremor to cease completely by the simple procedure of supinating

FIG. 35.



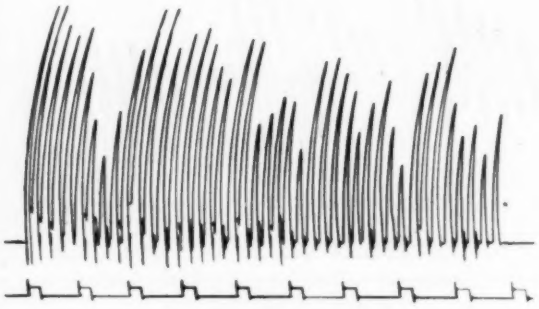
Parkinsonian tremor: almost mechanical rhythm.

his affected forearm and hand. In another case, hyperpronation ("voluntary") had precisely the same effect. (A cinematographic record of this phenomenon was shown.) Intelligent patients often work out for themselves some proceeding which has the desired result. This did not escape the acute observation of James Parkinson, who says in his essay that "the wearisome agitation is borne until beyond sufferance, when by suddenly changing the posture it is for a time stopped in that limb." He cites the case of a Parkinsonian patient, who, "to illustrate his observation as to the power of suspending the motion by a sudden change of posture, being then just come in from a walk, with every limb shaking, threw himself rather violently into a chair, and said, 'Now I am as well as ever I was in my life.' The shaking completely stopped; but returned within two minutes' time." In other instances, however, it vanishes for reasons as elusive as they are inconstant.

CLINICAL VARIETIES.

For years clinicians have recognised certain distinctions between the tremor of paralysis agitans and other striatal affections and that known as intention- or action-tremor, the latter being characterised by the fact that it begins only with "voluntary" innervation and increases with continuing action or "intention" up to a point, whereas the former is not so increased but may, on the contrary, diminish or cease. Further, action-tremor is seen only during "voluntary" motion, while the first variety occurs also when the limb is at rest. The supposed distinction has been recognised for centuries; it was already old when James Parkinson referred to it, quoting with evident approval the views of Sylvius de la Boe and of Sauvages, and indeed the germ of the idea is discoverable in the pages of Galen. In

FIG. 36.

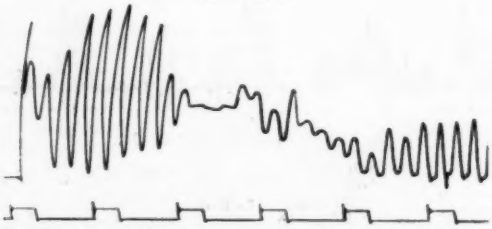


Parkinsonian tremor. Regular rhythm but variable amplitude.

Parkinson's words: "If the trembling limb be supported, and none of its muscles be called into action, the trembling will cease. In the real shaking palsy the reverse of this takes place; the agitation continues in full force whilst the limb is at rest and unemployed; and even is sometimes diminished by calling the muscles into employment."

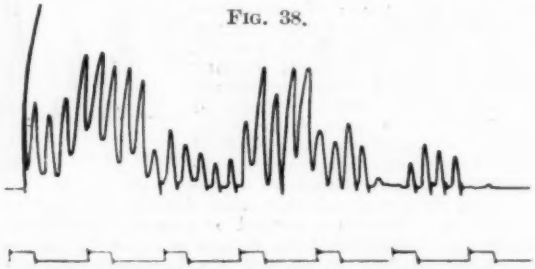
Notwithstanding this authority, the distinctions are much more apparent than real; some cases of disseminated sclerosis, for instance, definitely show what I may call a "rest-tremor" as well as an "action-tremor," while in progressive lenticular degeneration, as was demonstrated in my original monograph, the tremor is increased by voluntary action to a pronounced degree, though it is also prominent in the resting state. Thus combinations occur and invalidate distinctions. Moreover, in the finger-nose test the Parkinsonian limb at first often exhibits diminution or cessation of the tremor as it goes into action, yet after a moment or two of "rest" on the nose the fingers again become agitated, although the innervatory action of the limb musculature continues and the limb is certainly not "unemployed." Clinical observation proves further that while in some instances a Parkinsonian tremor is checked by firm "voluntary" closure of the fist of the affected limb, in other cases the effect is transient and minimal, and the tremor redevelops notwithstanding the active "employment." The exaggeration of the tremors of progressive lenticular degeneration by "voluntary" movement is strictly comparable

FIG. 37.



Progressive lenticular degeneration. Shifting of incidence of tremor.

FIG. 38.

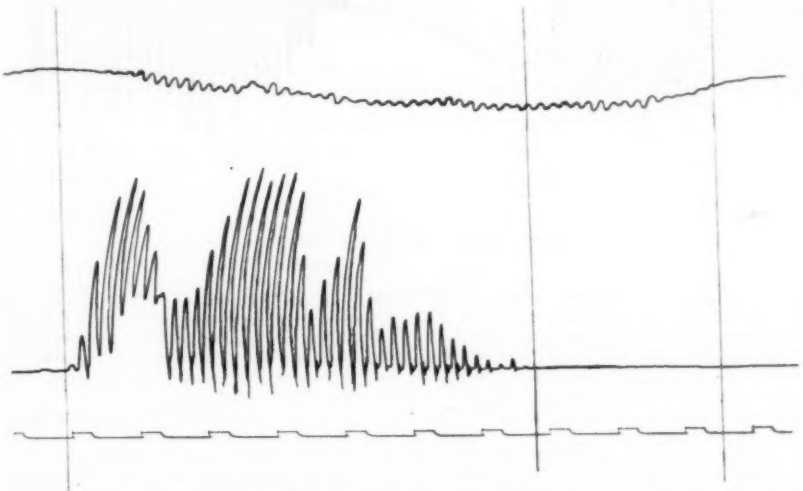


Same case as Fig. 37. Shifting of incidence of tremor.

to what obtains in disseminated sclerosis—an organic state to which "intention-tremor" is by some inaccurately, as I think, confined.

Reduction or cessation of tremor by supporting the limb—a reputed characteristic of action-, as compared with Parkinsonian, tremor—is met with nevertheless in the latter disease on occasion. Its occurrence has been shown in Fig. 39, taken from a typical case of the postencephalitic variety. On the other hand, the tracing of Fig. 42 is derived from a case of what I believe to be so-called idiopathic tremor, though I admit it is now exhibiting symptoms possibly suggestive of paralysis agitans. In this instance the tremor, at first seen solely during unsupported action of the limbs and vanishing instanter with support, is at length beginning to appear in the "resting state." On occasion, moreover, Parkinsonian tremors exhibit a crescendo feature (cf. Fig. 40), which is reminiscent of the similar crescendo of action-tremors.

FIG. 39.



Unilateral postencephalitic Parkinsonian tremor. Temporary appearance of tremor on the *unaffected* side (above). For details see text.

Finally, in this place, we may express doubt whether any hard-and-fast line can be drawn physiologically between a "resting" and an "active" state of muscle; action-currents in respect of these two differ only in a quantitative way. Clinically it seems a matter rather of degree of innervation than of differences in kind. From consideration of the data *the conclusion is, that the two types tend to run into each other and that neither is pathognomonic of involvement of a particular mechanism, radically distinct from that of the other.*

NATURE AND PATHOGENESIS OF TREMOR.

From its very nature we must allow that tremor can only be a phenomenon of a low physiological order, essentially different from the elaborate spontaneous movements of chorea and of athetosis. Tremor is purposeless and seems to have no "meaning," at least none easy of recognition, whereas choreic and athetotic action is subjectively purposeful if none the less futile.

(1) Various neuromuscular mechanisms are highly organised in the nervous system; others are organised in low degree or scarcely at all. Superior mechanisms are capable of great variation; inferior mechanisms are largely systematised. The more highly organised a mechanism, the lower is its physiological position. Spinal reflexes—e.g., the scratch-reflex—cannot be modified in respect of rate or character by variation of stimulus; cardiac and respiratory mechanisms are set at such and such a pace and, left to themselves, vary within narrow limits only. The fifty-a-second rhythm of motor nerve impulses is practically a constant. Instances of inherent neural and neuromuscular rhythms of minimal modifiability might be multiplied. By analogy, organic tremor is a physiological phenomenon of high organisation and low variability, for as we have seen its fundamental characters alter little and its average rate is fairly constant. It is constituted by a rhythmic discharge of neural energy, appearing in pathological states—a release-phenomenon set in a particular rhythm the innate nature of which, and its *raison d'être*, seem at present to be quite uncertain.

Clonus, similarly, consists of a rhythmical alternation in contraction of muscular groups, is a physiological state of a low order, falls into approximately the same rhythm as tremor, and undoubtedly tends to manifest itself when disease sets free inferior mechanisms. That tremor and clonus rates of contraction should not vary greatly from each other cannot be a pure coincidence, even though the anatomical cause of their respective releases be structurally different in each.

(2) This neuromuscular rhythm being normally held in check by inhibition and demonstrable only in certain diseased or abnormal states, the next point is whether for its appearance a particular condition of low motor centres, or of the muscles themselves, or both, is requisite.

It is not found clinically in states of complete "paralysis." A paralysed and flaccid limb is never the seat of tremor. On the contrary, relative integrity of motor power is essential, and if as the result of an additional lesion a limb that has been exhibiting tremor is temporarily paralysed, one of the clinical concomitants is temporary disappearance of the involuntary movement. A fair number of cases are on record of the disappearance of tremor after an ictus of a hemiplegic kind, but it is important to note the absence of the tremor corresponds only to the time during which by diaschisis the *lower* motor neurones are functionally out of action; with some restitution of their proper activity, though the hemiplegia remains, the tremor will reappear. I have myself reported a case of this kind, in which syphilitic mesencephalitis was associated with the clinical symptom of tremor; a "stroke" led to cessation of the tremor, but only for a time which corresponded to the complete outfall of function throughout the corticospinal system; the movement reappeared after this acute stage, implicating *lower* motor neurones by diaschisis, was over. One hundred years ago James Parkinson observed a case of paralysis agitans where a sudden stroke paralysed the right side of the body; "during the time of their having remained in this state neither the arm nor the leg of the paralytic side was in the least affected with the tremulous agitation; but as their paralysed state was removed, the shaking returned." I am not aware of any recorded case where tremor has *permanently* disappeared after an ictus involving the pyramidal tract, and that alone.

(3) As a corollary, for the appearance of tremor clinically the muscles implicated must be in a certain state of tone. Atonic limbs do not exhibit the pheno-

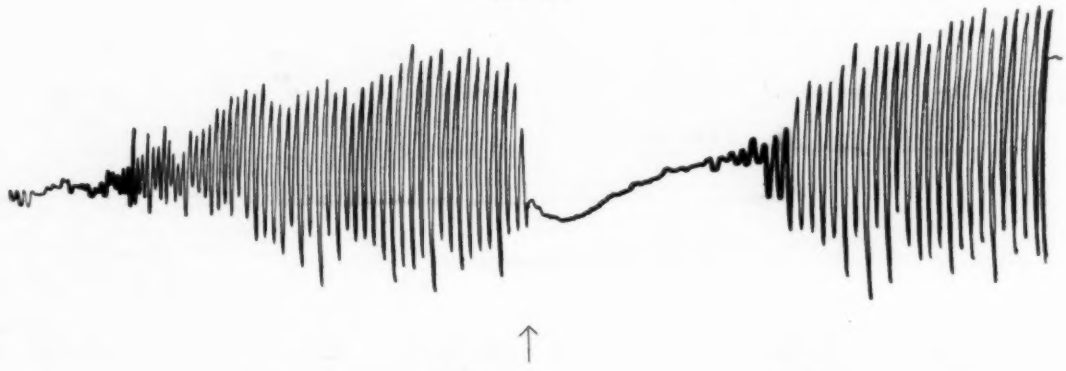
menon; they may be hypotonic, however, and, as a fact, also, either ordinarily tonic, or hypertonic. We must therefore ask ourselves whether any relation or proportion can be shown to exist between the manifestations of tremor and of muscle tone.

Of the common simultaneous occurrence of tremor and of muscle rigidity no question can arise; paralysis agitans is a frequent and convincing instance of the coexistence of tremor and rigidity; on the other hand, we have to explain the similar coexistence of tremor and hypotonia in not a few cerebellar cases. To take the former first: my studies lead to the conclusion that, clinically speaking, *those cases of Parkinsonism that are most rigid show least tremor, or tremor that is most limited in amplitude.* I have been able to convince myself of this interrelation by the frequent observation in postencephalitic cases, that with diminution of the rigidity by treatment the patient will likely pass through a stage in which the tremor becomes correspondingly more obvious. Several patients have made this observation independently and have commented on it. Conversely, tremor wide in excursion and sometimes almost violent is seen in cases where rigidity is at a minimum. Further, in any ordinary case of the syndrome those muscular groups which are more rigid (proximal segments) always exhibit less tremor than those that are less obviously rigid (peripheral segments), and the same remark is true in respect of lips, tongue, &c. Similar observations have been made for other striatal conditions such as progressive lenticular degeneration. Precisely those cases have exhibited the "wildest" tremors in which muscular rigidity has not been extreme.

Taking, next, cases where we have reason to suppose cerebello-mesencephalic lesions exist, rhythmical tremor resembling that of Parkinson's disease may be associated with a hypotonic state of the musculature. A number of such cases have been personally observed, and others have been made the subject of study by Holmes in his Croonian Lectures (1922). I am not able to cite any clinical instance of such tremor having been modified by subsequent alteration of the hypotonia through additional disease to a hypertonia, though were such a case to be studied and reported it would prove valuable.

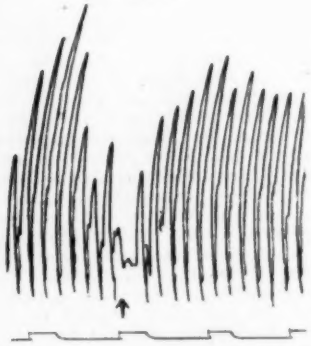
According to a view expressed by Holmes, tremor is seen in hypotonic states only when "both the agonists and their opponents are contracted," as when a finger is to be held steadily say close to the nose without actually touching it. Diminution of postural tone allows the limb to oscillate, failure of fixation being followed by alternating contractions of certain groups of muscles and their antagonists. His explanation, however, only applies to cases where a hypotonic limb is being held "voluntarily" in such and such a position without support. Now we have seen similar oscillatory tremors to develop in limbs that are not hypotonic, as in some cases of paralysis agitans; and in the study of progressive lenticular degeneration, where also the musculature is hypertonic, analogous tremors have often been seen. Again, some cerebellar tremors of a regular,

FIG. 40.



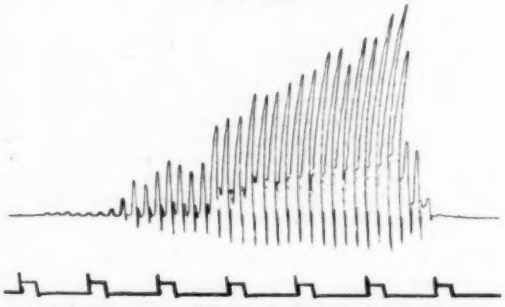
Parkinsonian tremor. Cessation after momentary cutaneous stimulus.

FIG. 41.



Parkinsonian tremor. Transient inhibitory effect of auditory stimulus.

FIG. 42.



Tremor (organic) produced when limb is unsupported and ceasing when it is supported.

rhythmical sort are seen when no "active" innervation is taking place, as when a limb is hanging over a chair or over the edge of the bed (Holmes). That "voluntary" innervation is not a factor in the "spontaneous" tremors of resting limbs is of course obvious; nor is gravity a consideration, for the limb may be so placed as to counteract its action, yet the tremor continues.

Evidently, as tremors that are clinically indistinguishable can be seen to develop in limbs whose musculature is of differing degrees of tone—hypertonic or hypotonic—no explanation based solely on the state of tone can be applied universally. It is commonly understood, I think, that the rhythmical alternating discharges of clonus are dependent on enhanced muscle tone in the units concerned; an abrupt passive stretching effects a "stretching contraction," and this in turn will bring about a similar contraction in the antagonistic group, and so on almost indefinitely, so long as adequate tension is passively maintained. No explanation of this kind is applicable to the "spontaneous" tremors encountered by the clinician. Nor is any elucidation based on the presence or absence of "active" innervation sufficient to cover all the facts.

While, then, as regards diseased states characterised by both tremor and rigidity the degree of the latter is usually in inverse proportion to the extent of the former, we are not justified in claiming the tremor to be an expression of the muscular state *per se*. It is never found in the extremes of absolute atonia or hypertonia, but apart from these it may invade muscles whose tone varies within rather wide limits. Hughlings Jackson considered tremor and rigidity as it were opposite aspects of the same thing; he said that "tremor differs from rigidity, not fundamentally, but in degree," and explained the latter as being tremor "run together." He applied the idea in several other directions; for example, he spoke of a "diluted convulsion" as producing a condition "superficially like tremor." Again, he said that if by some magical process the movements made by a man in running were to occur simultaneously, "the result would be, not any movements properly so called, but an arrest of locomotion by a stiffening of the body into one attitude, a contention of all movements of locomotion." The applicability of this ingenious conception to the present question will be at once apparent to the reader. In a recent communication Walshe, however, declares the view that tremor and rigidity are interrelated to be "wholly untenable," although, curiously enough, he does not mention it as being due to Hughlings Jackson. That they are sometimes thus related is clear from their occurrence in inverse ratio, as illustrated above in Parkinsonian cases; but in other instances no such proportionate connexion is demonstrable.

(4) The fact that *tremor is not found clinically either in cortical or in spinal cases* I consider of prime significance. A lesion of the corticospinal system is not by itself sufficient to produce tremor, as everyone knows. As far as I am conversant with the literature, no case of tremor is on record pathologically in which the lesion has not involved grey matter situated somewhere in the vicinity of basal ganglia, mesencephalon, or cerebellum. In pointing out the occasional temporary cessation of established tremor by a corticospinal lesion, I do not admit the possible inference that, as Hunter states, "impulses through the cerebrospinal tracts are involved in the production of spontaneous tremor," if thereby the cortical arc is thought to be essential for its appearance. On the contrary, the evidence points in a quite other direction.

Brief consideration of the above-mentioned general localisation of the lesions associated with the appearance of tremor clinically at once suggests the existence there of some prespinal (supraspinal) centre or centres of control over a lower mechanism, whose activity expresses itself in the form of rhythmical alternating contractions of a given muscle group and its opposite, at a more or less set rate. Following the invariable rule, we say that since the lesions associated with tremor are destructive the supraspinal centre controls or inhibits, and when it is injured the lower mechanism is "let go." The alternations of tremor are, of course, an instance of reciprocal innervation, contractions of opposite muscles succeeding each other harmoniously in a never-ending series. We thus reach the conception that for tremor a particular condition of low motor centres is requisite, and that the state of tone of the muscles themselves is of less significance. None the less, it does not seem to be a mere coincidence that the levels of the lesions associated with tremor are also those from which alterations of muscle tone in large degree arise.

I must in the present instance leave on one side the data that might be adduced from experimental physiology to aid in specifying with greater exactitude the localisation of tremor-effecting lesions, as far as in the present state of knowledge we are able to do so. A brief excursus, however, may not be out of place.

Magnus has not seen tremor in any of his experimental "thalamus" animals, and comments on this absence of involuntary movement apropos of current striatal theories. Now in that animal *both* the corticospinal paths *and* the corpora striata are cut off from the parts further back (lower down)—an experimental state not in any way comparable to the lesions usually associated with the development of tremor in man. In fact, few if any experiments hitherto have satisfactorily reproduced the kind of case the clinician frequently encounters. That tremor, none the less, is occasionally producible by experimental methods is known from the work of Economo and Karplus, and of Lafora. In Graham Brown's stimulation experiments on the mesencephalon (decerebrate animal) tremor has been obtained in the red nucleus vicinity. I had the opportunity of seeing one of the hemi-decerebrate cats of Bazett and Penfield, and observed tremor in the advancing of the limbs on the affected side. The now rather older experiments of Ferrier and Turner on the superior cerebellar peduncle have lost none of their importance quâ the experimental production of tremor.

(5) Clinico-pathological evidence does not at present enable us to pronounce with certainty on the relative claims of the corpus striatum and the cerebellum (naming only two collections of grey matter) to constitute that tremor-controlling supraspinal centre which in view of the data here collected and the argument advanced we are justified in postulating. In former communications an attempt was made, possibly somewhat rigidly, to connect tremor with the lenticulo-rubro-spinal path. I have never doubted, and further pathological knowledge only serves to substantiate, the general conclusion formerly reached as to the localisation of the lesions underlying its appearance; their relative limits have already been specified. But a purely clinical study of the present kind cannot give us all the material requisite for final decisions.

Viewed from another angle, however, as we have seen, tremor is to be considered the outcome of activity of a low-grade physiological mechanism released from a *non-volitional* prespinal centre, and it therefore becomes a matter of some interest to ascertain the relation of "volition" to, and its degree of control over, this *otherwise* decontrolled (say) mesencephalo-spinal mechanism.

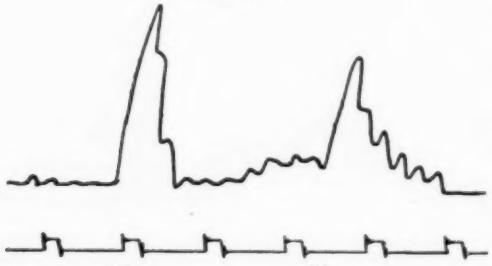
THE PROBLEM OF "VOLUNTARY" CONTROL OVER AN "INVOLUNTARILY" DECONTROLLED MECHANISM.

The question, it will be realised, is a particular instance of an interesting physiological problem of which other examples readily suggest themselves. When a low-level centre is under the inhibitory influence of say two higher level centres of different kinds, one "volitional" and the other "non-volitional," what difference, if any, does the

withdrawal of the latter control effect in the manifestations of the former control?

In the matter of tremor, "voluntary" influence is variable, fleeting, and not to be foretold, as it were. Thus during "voluntary" innervation of a tremor-exhibiting group of opposite muscles (say flexor-extensor) the current may suffice to blend the

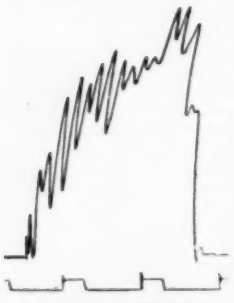
FIG. 43.



Parkinsonian tremor inhibited during "voluntary" contraction of affected muscles.

"involuntary" innervations into a tetanising contraction, of one or other muscle, as may be, with corresponding (relative) disappearance of the phenomenon for the time. Yet this is by no means constant, for in other instances "volition" augments and exaggerates existing tremor, or, alternatively, seems to bring out a latent state of this, existing as it were *in potentiâ*. Attention is directed to the accompanying figures. Fig. 43 is a direct tracing from the left quadriceps extensor cruris of a Parkinsonian patient with moderate rigidity and well-marked typical tremor. At (*a*) and at (*b*) "voluntary" contractions of the quadriceps were made, and during the ascent of the curve (shortening of the muscle) no tremor contraction is visible, though these begin again at once with decontraction, and continue. Now in the case of another equally characteristic example of the affection (Fig. 44) no such checking of the "involuntary" contraction is seen; on the contrary, it is traceable both in ascent and descent of the curve (contraction and relaxation of the extensor communis digitorum). Similar circumstances to those of Fig. 43 obtain in the record reproduced in Fig. 45, from another case (also left quadriceps). At (*a*) and (*b*) "voluntary" innervation serves to blend, or inhibit, "involuntary" innervations; at any rate, they are no longer to be recognised. If the reader will look back at Fig. 16, he will see how existing tremor is inhibited during the "voluntary" contraction of the extensors of the fingers and begins at once when the summit of contraction is reached, while during synchronous and equally "voluntary" (in the sense that the whole movement is one of "volition") decontraction of the extensors of the wrist the tremor maintains itself. The involuntary contractions blend with the "voluntary" contraction, but not with the "voluntary" relaxation that is going on simultaneously.

FIG. 44.



Parkinsonian tremor not inhibited during "voluntary" contraction of affected muscles.

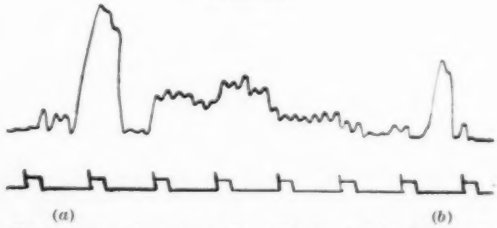
No other conclusion, I submit, can be drawn than that "voluntary" control over an "involuntarily" decontrolled mechanism is both imperfect and uncertain. It is unable to prevent the phenomena from making their appearances. The amount and maintenance of control are alike so variable that they preclude the possibility of similar fixed structural defects being responsible for the phenomena in every case. In a given instance it seems difficult to say what the interrelation of higher and lower mechanisms will turn out to be; tremor may be transiently inhibited by "voluntary" employment of muscles, or, on the contrary, it may accompany such action and refuse to be controlled—and this in different examples of the same disease. I believe considerations of this kind enable us to understand better the essential fluidity and variability of the clinical manifestations of tremor as described in preceding sections.

CONCLUSIONS CONCERNING TREMOR.

Summarising the results of the foregoing analysis of tremor, I may indicate some conclusions:—

Tremor cannot be due solely to a particular or specific manifestation of muscle tone, for it is met with in hypertonic, tonic, and hypotonic states; the fact of its being set in a rhythmical way at an average rate of fair constancy suggests it is the expression of an inherent property of neurocellular activity; its

FIG. 45.



Parkinsonian tremor: "blending" of "involuntary" contractions during "voluntary" innervation.

mechanism is of low physiological grade and is controlled by an ("involuntary") prespinal centre or centres at the general level of corpus striatum, cerebellum, and mesencephalon.

"Voluntary" inhibition of this "involuntarily" decontrolled mechanism is essentially imperfect, inconstant, uncertain, and unsustained.

Tremor differs in fundamental characters from choreo-athetosis, above all in the fact that the law of reciprocal innervation is not abrogated in its case. Its underlying mechanism is quite distinct from that of the other group.

Tremor is an involuntary movement belonging to the old motor system (infracortical, subpallial), while choreo-athetosis is an involuntary movement of the new (cortical, pallial) motor system.

MOTOR FUNCTIONS OF THE CORPUS STRIATUM.

No pretence has been made in these studies to cover the whole field of striatal symptomatology, since they have been oriented from a somewhat different viewpoint. Much of the research, however, has an obvious bearing on theories of the function of that particular collection of grey matter, so that some discussion of our analyses of motor and muscle tone disorders is desirable in this connexion.

At the outset the serious obstacles in the way of reaching final conclusions were enumerated. Our uncertainty as to the diseases to be designated striatal (and solely striatal) on precise neuropathological grounds was specially emphasised, and hesitation in respect of these is still both natural and warrantable, notoriously as far as Huntington's and Sydenham's chorea is concerned. By comparison Parkinson's disease and progressive lenticular degeneration may be supposed to be less equivocally striatal.

Clinical analysis of various types of movement, and of the precise symptomatology of the two last-named affections, gives the following results. The

assertions that they are characterised by "loss" of associated movements, reaction and defence movements, movements of coöperation, have been shown to be inaccurate. The view assigning a localisation of "automatic" movements to the corpus striatum is equally devoid of foundation. The law of reciprocal innervation holds for movement in striatal cases of the above group. Catatonic phenomena have no place in the syndrome. Still other points indicative of misinterpretation of alleged striatal motor symptoms have been recapitulated at various stages in the course of the lectures.

It may be of interest, perhaps, to refer now to one or two fallacies that have been noted in regard to movements and their meaning and localisation.

(1) One of the more serious is that which draws a hard-and-fast line between "voluntary" and "automatic" movements. No such line as a fact exists. "Automatic" movements, it will be granted, have been originally acquired, and, consequently, have at one stage contained a definite "voluntary" element. The child learns to walk. The supposition that this class of movement is at some unknown time transferred physiologically from a cortical locus to a striatal locus is devoid of any sort of probability and unsupported by any sort of evidence. However "automatic" walking and arm-swinging become, they remain faintly "voluntary." As I have previously urged, the gradation is not from "voluntary" to "automatic," but from "least automatic" to "most automatic," or from most to least "voluntary." After permanent lesions of the pyramidal system many acquired "automatic" movements are permanently lost. Were the intact corpus striatum the seat of these, they should exteriorise themselves via the lower motor neurone, which is not impaired *per se* in hemiplegias.

The other side of this question, so to speak, is that I have shown many cortical movements do not contain the element of "volition," but otherwise are similar in every respect to "voluntary" acts. Complex and elaborate tics are an instance in point, as are the motor phenomena of chorea. Before epidemic encephalitis became a clinical commonplace, tics were on their intrinsic clinical and ætiological characters with entire correctness attributed to disorder of cortical function. Some writers now appear to envisage all motor symptoms through an encephalitic fog, arguing for a striatal localisation of peculiarly elaborate movement-complexes because, forsooth, the virus of encephalitis has a striatal site in Parkinsonian cases! Such a claim can be made only at the expense of utterly ignoring the intrinsic clinical features of the movements in question. The corollary is logical, that if postencephalitic tics and bradykinetic syndromes are a sequel to striatal destruction, they must require for their activity non-striatal mechanisms. No hint is given as to where these are situated; but, assuming from the complexity of the movements that they are of cortical type, the inference would be that the corpus striatum is higher in the physiological hierarchy than the cortex itself, and that it controls the latter, so that when it is disordered cortical activity is "let go." This is contrary to all our conceptions of cerebral physiology.

The argument in preceding pages has pointed in the direction of a transcortical failure of inhibition in the case of high-type movements such as those of chorea, and the same argument is applicable to tics and similar involved and intricate movement-combinations. Continuing this line of discussion, I have already alluded to the fact that movements obtained experimentally from the motor cortex proper are not identical in all respects with the movements of "volition." Physiologically, they are of a lower class. The clinical phenomena of Jacksonian epilepsy bear out this view. I have seen individual muscles in pathological contraction from disease of the motor cortex, muscles that cannot be innervated "volitionally" in the same way. For example, I have seen in a Jacksonian case twitching of the right forefinger and thumb (a usual symptom, and of course not inherently different from "voluntary" movement of the same part) with *simultaneous twitching of the right levator menti alone*—this latter illustrates the present point. Again, I have observed distinct and prolonged *unilateral* twitching of the rectus abdominis in a Jacksonian case. I do not require to adduce more data to show that morbid processes can effect individual muscular contractions from the motor cortex, and that movements physiologically coupled can be dissociated similarly by *cortical* motor disorder. Further, interference with and derangement of the harmony of action of component muscular units in movement may occur at the cortical level and have been fully illustrated.

The Betz-cell anatomical area, then, is no more than a midway station between what I should prefer to call the true motor area of "volitional" action—viz., some much larger cortical region, possibly the frontal, and the lower centres of the pons, medulla, and cord. Clinical analysis of choreo-athetotic symptoms has shown us every variety of physiological dissociation and dysharmony in contraction of opposite groups, and converging lines of evidence have suggested such disintegration may take place at the cortical level.

(2) A second fallacy is common and insidious, consisting in the tendency to attribute to lesions at one physiological level symptoms which may in fact arise at more than one. If integration of neural levels is essential to harmonious motor activity the possibility of disintegration through a series of levels must be steadily borne in mind. I have illustrated the point in the case of such symptoms as micrographia, akinesis, poverty of movement, and catatonia. Since such symptoms may be caused by dysfunction at more than one neural level, no exclusive apportioning of the particular symptom to an anatomical lesion on one only can be justified. For several Parkinsonian symptoms I have shown above the probability of the intervention of a "conscious" factor. Not a little of the seeming akinesis follows from the patient's unwillingness to initiate movements that he knows will entail an effort. "Awareness" has been proved to play a part in the meagreness of the reaction- and defence-movements of some Parkinsonians. In these latter types the implication of cortical arcs is highly probable, since the selected excitations reach the sensorium. If they are to be set down to striatal activities alone, and their absence to striatal disease, we are faced with the assumption that striatal function is a conscious function, for which it appears to me no evidence whatever can be adduced.

(3) A third source of confusion in a difficult subject arises from the variability of the symptoms called striatal at different times and under different circumstances, of which numerous clinical instances have been provided in these lectures. To identify symptoms with anatomical lesions thus becomes an unusually delicate and precarious business. As long ago as 1912 stress was laid, in discussing the pathogenesis of tremor and other involuntary movements, on the possibility of dynamic modifications of function without recognisable anatomical lesions. "Loss" of movement is a very elastic term. We have had more than one illustration above of the habit of arguing that "loss" of a movement justifies the supposition that the normal ganglion is the centre for precisely those movements which are considered to be "lost." What, then, is the anatomical state of the organ when movements are present at one time and absent at another?

I should like, in conclusion, to approach the problems that have occupied our attention from still another point of view.

(1) It is a priori highly improbable, and contrary to the dictates of common sense, that motor phenomena so conspicuously diverse and of such varying complexity as myoclonus, tremor, athetosis, chorea, tics, bradykinesis, torsion-spasm, micrographia, and

palilalia, should one and all be set down to disorder of striatal function. When we remember the histological simplicity and comparative structural homogeneity of the corpus striatum, in contrast with the greater dimensions, much more intricate cyto-architectonic complexity, and far wider connexions of the rolandic motor cortex, the idea of attributing all these disturbances to striatal disease, and of crowding corresponding "centres" into that ganglion, becomes nothing short of ludicrous. And we have seen that this Betz-cell area itself is physiologically inferior to a still larger motor region, which much cogent evidence suggests may be constituted by the frontal lobes. Too little attention has been devoted by striatal enthusiasts to the phenomena of apraxia or dyspraxia, to the movements of so-called coördinated epilepsy, to the syndrome of tonic innervation, to epilepsia partialis continua, and to other cortical and trans-cortical disturbances exteriorising themselves in motor symptoms, some of which at any rate are of a kind persistently attributed to affections of the corpus striatum.

In this connexion an anatomical look-round will help to correct distorted perspectives. The corpus striatum is a much simpler morphological structure than the cerebellum, simpler even than the optic thalamus, in which nuclear organisation has reached a stage unknown to its neighbouring ganglion. But no neurologist has hitherto assigned to disease of the cerebellum a heterogeneous miscellany of motor disorders of the kinds with which the corpus striatum is sorely overloaded. Some would reduce cerebellar function, perhaps with reason, to two or three elements, or even unify it completely. How, then, a relatively simple cell-fibre structure like the corpus striatum can mediate functions ranging from language (cf. palilalia) to innervation of muscle fibre (cf. myoclonus) is on the face of it inexplicable.

(2) Consideration of the intrinsic clinical features of some of the motor disorders put down to striatal dysfunction proves that under no circumstances can they be conceived of as resulting from defect or destruction of identical or similar mechanisms, for while some are physiologically of a high order others are of a low. Some can be understood only on the view that they contain elements belonging to the cortical series.

(3) My clinical studies have impressed me again with the belief, for which much support has been furnished here, that striatal symptomatology and striatal function must be comparatively simple; and they have forced me to the conclusion that the unwieldy and top-heavy symptom-complex which has gradually come to be erected on the ganglion must be rigorously stripped of non-essentials. In the preceding pages have been indicated the symptoms which must thus be discarded.

I have found no reason to modify in any important respect the syndrome originally enunciated, to the effect that the main features of disease of the corpus striatum consist of disorder of muscle tone regulation and the appearance of involuntary movements. These being "positive" symptoms, their causation is the freeing of non-striatal mechanisms from striatal control. The corpus striatum is a body one of whose functions is tone-control, for in its diseased state tone over-develops in the skeletal musculature generally; another of its functions is that of inhibiting the physiologically lower function of neuromuscular rhythm, for when it degenerates tremor is prone to make its appearance. I do not think, however, that in either respect its function is unique and exclusive of that of other centres of approximately the same order.

The "negative" symptoms of striatal disease would be constituted by actual loss or outfall of—what? Clinical analysis will not allow me to point to a single class of movement which is as a fact persistently and completely lost when the ganglion is out of action. We have had many instances of the ways in which different classes of movement are hampered as a sequel to striatal disease, but none of an absolute paralysis of any class. Fine movements of small muscles are seriously impaired—if the expression is preferred, "lost"; but then they are "lost" also in pyramidal disease. In this, as in certain other respects, gaps in our knowledge of striatal function remain to be filled.

Throughout these lectures no attempt has been made to assign separate functions to the composite parts of the whole ganglion, for in this region in particular speculation has completely outrun both clinical and pathological facts. On a previous occasion I have assembled the arguments against this special variety of striatal conjecture.

These studies were undertaken in the hope of making a further constructive addition to our knowledge of the basal ganglia, and if in some ways my results should seem rather of a negative or destructive kind I can only say that revision was sorely needed.

A STUDY OF THE FAMILY HISTORIES OF 300 PATIENTS SUFFERING FROM CHRONIC UPPER ABDOMINAL LESIONS.

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THE patients under consideration were all under the care of my two chiefs, Mr. James Sherren and Mr. E. C. Lindsay, at whose suggestion this investigation was carried out, and to whom I am indebted for permission to use the figures obtained.

The lesions present were of four types: Chronic gastric ulcer (simple), 95; chronic duodenal ulcer, 129; carcinoma of the stomach, 30; cholecystitis, 57; total 311.

In every case the diagnosis was definitely confirmed at operation, and, where necessary, by further pathological investigation. Some cases showed more than one lesion—hence the total number as shown in the table exceeds the number of patients.

Some patients with one or more of these upper abdominal conditions have given very interesting family histories, which show a remarkable tendency to the occurrence of these lesions in members of the same family. The following are striking examples:—

CASE 1.—A glass packer, aged 50, was admitted into the London Hospital and transferred on June 20th, 1925, to Mr. J. Sherren. At operation three days later the diagnosis of duodenal ulcer was confirmed. The familial tendency is shown below.

CASE 2.—A medical student, aged 24, admitted under Mr. Sherren, Dec. 12th, 1924, with a history of recurrent attacks of biliary colic. At operation the gall-bladder contained no stones, but showed evidence of chronic cholecystitis and was removed; the diagnosis was confirmed on pathological examination. The family history given is tabulated below.

Further examples will be quoted later. Of those investigated the most striking histories were obtained from those patients suffering from duodenal and gall-bladder lesions. The occurrence of such family groups as these leaves one with the undoubted opinion that there is a distinct family tendency to these diseases.

Familial Tendency.

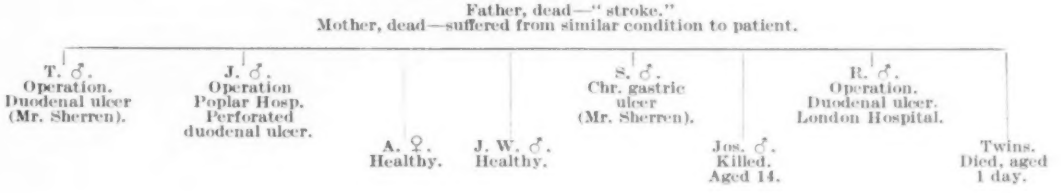
Little has been written on the subject, but in 1921 there appeared an interesting article by Hurst,[1] who drew attention to the undoubted existence of such a familial tendency, and expressed surprise that the fact had been rarely recognised in the past. This same point was also emphasised by Sherren[2] in 1924.

An attempt was made to estimate this tendency by means of records of a long series of cases. 300 consecutive cases operated upon have been investigated, each patient being asked as to the family history, and any history of indigestion has been counted as a

[1] Hurst, A. F.: Guy's Hospital Reports, 1921, lxxi., 450.
[2] Sherren, J.: THE LANCET, 1924, i., 477.

positive case. The term "indigestion" is, however, one which is very loosely used, and as in the majority of instances no exact diagnosis could be obtained—a control series of 100 cases, none of which patients suffered from indigestion or abdominal disease, was obtained. The results are shown in Table I.

CASE 1.—*Family History.*


Father, dead—"stroke."
Mother, dead—suffered from similar condition to patient.
T. ♂. Operation. Duodenal ulcer (Mr. Sherren).
J. ♂. Operation Poplar Hosp. Perforated duodenal ulcer.
A. ♀. Healthy.
J. W. ♂. Healthy.
S. ♂. Chr. gastric ulcer (Mr. Sherren).
Jos. ♂. Killed. Aged 14.
R. ♂. Operation. Duodenal ulcer. London Hospital.
Twins. Died, aged 1 day.

CASE 2.—*Family History.*

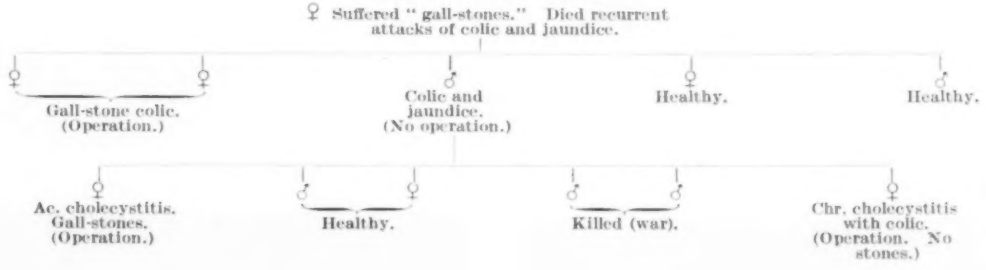


TABLE I.

—	No. of cases.	No. with indigestion.	Per cent.
Upper abdominal lesion ..	300	137	46
No history of "indigestion"	100	16	16

It is of interest to compare the frequency of these family histories in the various lesions, and this is shown in Table II.

TABLE II.

—	Total cases.	No. with indigestion.	Per cent.
Duodenal ulcer ..	129	56	43
Gastric ulcer	95	47	49
Gall-bladder	57	24	42
Carcinoma	30	10	33

The points to be noted about Table II. are:—

1. The manner in which the percentage agrees in the first three groups.

2. The lower percentage shown in the carcinomatous cases. Carcinoma of the stomach may arise clinically in one of two ways—(1) primary, (2) secondary to a chronic ulcer. In carcinoma the familial tendency is not nearly as strongly marked; at the same time it should be noted that the percentage is higher than in the 100 "no indigestion" cases, and this is probably accounted for by the fact that in some of the cases the carcinoma arose on an old ulcer.

3. The gastric ulcer cases show the highest figure, although it has already been pointed out that the more striking histories are obtained in the duodenal and cholecystitis patients. This may possibly be accounted for in the following way—the duodenal ulcer tends to run in healthy families, whereas the gastric occurs as a rule in a family with a lower standard of general health, and so there is more probability of other extraneous causes of indigestion being present—e.g., ptosis.

The above figures confirm the fact already stated that there is a distinct family tendency to these diseases, though probably these figures, which are of necessity based on that extraordinarily vague term "indigestion," are of less importance than family histories, such as those recorded above in which the lesions were proved at operation.

Hurst in his article says:—

> "It is an interesting fact that I have never myself seen one member of a family in whom the presence of a gastric ulcer was proved, and another in whom a duodenal ulcer was certainly present. This suggests that the types of stomach which predispose to the development of gastric and of duodenal ulcers respectively are congenital, and either one or the other may exist in several members of the family."

Although Hurst states that he has never proved the presence of a gastric and duodenal ulcer in two members of the same family, such cases do undoubtedly exist; three such cases I quote below.

In Case 1 mentioned above it will be seen that three brothers were proved at operation to have duodenal ulcers, whereas a fourth one, who was also operated upon, had an ulcer situated on the lesser curve of the stomach. Two further cases are as follows:—

CASE 3.—On Nov. 15th, 1923, a male, aged 30, was admitted and later operated upon for chronic duodenal ulcer. His mother had previously been operated upon for a carcinoma, which had supervened upon a chronic simple ulcer of the stomach.

CASE 4.—In February, 1925, a man of 40 was operated upon for acute cholecystitis; his father had previously been admitted and operated upon for a perforated duodenal ulcer.

The suggestion that the types of stomach predisposing to gastric and duodenal ulcers respectively are familial is probably largely true. There is, however, also probably a family tendency to certain infections which predispose to the formation of peptic ulcers; such are dental caries, as is shown below, and appendicitis, as mentioned by Sherren.[2] Now as probably in a family there are often the predisposing factors to both infection and the localisation of the ulcer, it is from members of these families that we obtain the most striking histories in which many suffer from one particular lesion—e.g., duodenal ulcer. If, however, the infection is the only common predisposing factor, then in one patient the lesion may be a duodenal ulcer, and in another member of the same family a gastric ulcer or gall-bladder infection.

The latter is illustrated in the first case mentioned, for in a family of four brothers, two, who were X rayed, had stomachs of different types—one high and hypertonic and the other low and sagging. In all the four brothers, however, there was a very definite history of marked dental caries preceding the onset of symptoms.

THE VALUE OF LIPIODOL IN THE DIAGNOSIS OF BRONCHIECTASIS.

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IN cases of unilateral bronchiectasis good results may be obtained by artificial pneumothorax or thoracoplasty. Usually, however, the disease is bilateral, and it is owing to this that the treatment so frequently fails. If an artificial pneumothorax is induced the quantity of sputum is reduced, but if there is disease in the other lung this reduction may be insufficient to afford the patient any real relief. The refills can then be stopped and the lung allowed to re-expand. If, however, thoracoplasty has been performed it is another matter.

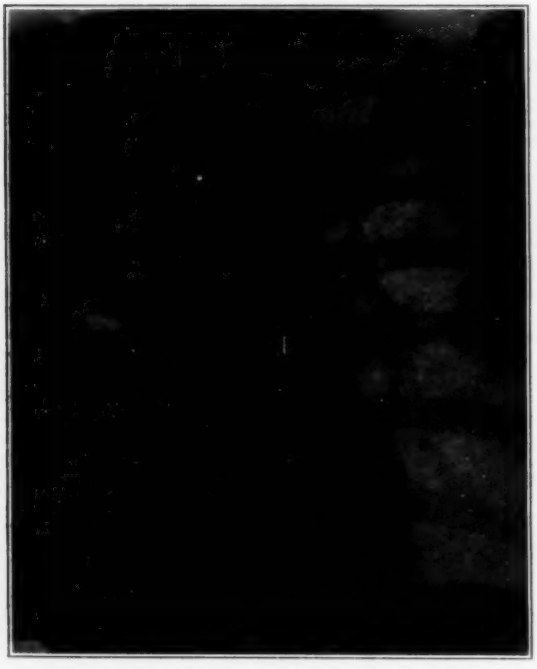
In one of our cases, a man with bronchiectasis had a large quantity of very foul sputum, was toxic, and running a high temperature. After an artificial pneumothorax had been induced he rapidly improved. He became afebrile, and what little sputum was left was no longer offensive. The collapse, however, was not complete owing to adhesions and areas of adherent pleura and, as so often happens in such cases, the lung was gradually drawn out and the pneumothorax cavity obliterated by the spread of these adherent patches. The symptoms returned and he became ill once more. As he had shown such great improvement when the lung was collapsed it appeared that there could be very little disease in the other lung, and he seemed to be an ideal case for thoracoplasty. This was performed and there was an immediate improvement, but unfortunately he contracted pneumonia and died.

In many cases, however, there is so much adhesion of the pleural surfaces that artificial pneumothorax cannot be induced at all, and it then has to be decided whether the better lung is sufficiently healthy to justify so serious an operation.

The following case illustrates the value of lipiodol in helping to form an opinion as to the state of the better lung.

The patient, a man aged 41, is a motor mechanic who enjoyed good health until February, 1922. He then had an illness which was diagnosed as influenza and pneumonia. Since that time he has had a cough and sputum, and every two or three months he has a febrile attack during which he brings up a quantity of offensive sputum. In October, 1924, he had an attack of dry pleurisy on the right side, and he went into a sanatorium. There were signs of fibrosis in the upper zone of the right lung, but although the sputum was repeatedly examined, no tubercle bacilli were found. At present his general condition is good between the febrile attacks and does not suggest any active tuberculous disease. He has great clubbing of the fingers. The right side of the chest is flat below the clavicle, and the percussion note is impaired all over the right side. Crepitations are heard at the right base and axilla, and there are a few below the right clavicle. On the left side expiration is slightly prolonged, the percussion note is resonant, and a few crepitations are sometimes, but not always, heard at the base. During the febrile attacks there is an increase of signs at the right base and axilla, but not on the left side. X rays (Fig. 1) show extensive fibrosis of the greater part of the

FIG. 1.



Radiogram taken before injection of lipiodol. Left lung apparently sufficiently healthy to justify thoracoplasty.

FIG. 2.

Radiogram taken after injection of 20 c.cm. of lipiodol into the trachea. Condition of left lung contra-indicates thoracoplasty.

right lung with interlobar pleurisy. The left lung shows only a general emphysema with some peribronchial thickening. Both from the clinical and X ray point of view it would appear that there is not sufficient disease in the left lung to contraindicate a right-sided thoracoplasty, if, as is probable, artificial pneumothorax cannot be induced. After injecting 20 c.cm. of lipiodol into the trachea with the patient lying on the left side, X ray (Fig. 2) showed very considerable disease at the base of the left lung, and on this account one could not advise a right-sided thoracoplasty.

We have seen more than one case where nothing was found in the better lung which seemed to contraindicate thoracoplasty, yet (after attempts to induce artificial pneumothorax had failed) the patient received no benefit from the operation, owing, no doubt, to disease in the other lung. The mortality from the operation for thoracoplasty is by no means negligible. Apart from this, it is a drastic method of treatment which cannot be lightly recommended, and lipiodol is undoubtedly of value in coming to a decision whether a case is suitable for the operation.

Reviews and Notices of Books.

THE CRIPPLED HAND AND ARM.

By CARL BECK, M.D. London: J. B. Lippincott Company. 1925. With 302 illustrations. Pp. xi. + 243. 30*s*.

THE author of this book, a well-known Chicago specialist, has had ample opportunities of dealing with the various types of deformities of the hand and arm as the result of abnormal development, injuries and disease, and that he has made good use of those opportunities. As he states in his introduction, this work involves a great deal of plastic surgery, and, indeed, this book might well have been called "the plastic surgery of the upper extremity."

Part I. includes chapters on the normal anatomy and physiology of the part, and the rest of it is devoted to the consideration of crippled hands. In Part II. disturbances of the wrist, forearm, elbow, and upper arm crippling the hand are dealt with, and there are a few pages on artificial arms and a short chapter on technique. For the cure of webbed fingers, after describing some of the classical methods, including the impracticable one of Didot, Dr. Beck advocates the formation of a tunnel at the bottom of the interdigital cleft by means of a modification of Rochet's procedure for urethroplasty. For congenital defect of phalanges he recommends what is known in Europe as phalangisation of the metacarpals, but he seems to be unaware that he is not himself the first to use such a method. Priority, however, is of little moment compared with the excellent result obtained in the case here described. Hands crippled in all sorts of ways and to varying extent by mutilating injuries and burns have offered to the author a wide field of work in which he seems to have displayed high judgment and great patience. The truly heroic treatment recommended for Dupuytren's contracture of the palmar fascia should be noted. Dr. Beck considers that the only satisfactory method of treating an advanced case is by excising the whole of the skin and fascia of the palm and substituting for it an Italian graft from the chest or abdomen. He records a successful case. Part II. is, perhaps, of less interest. It will be noticed that, as he himself confesses, Dr. Beck is very fond of the method of Tagliacozzi, and relies largely upon it to provide skin to fill the numerous gaps made by his straightening operations, taking his grafts generally from the chest and less often from the abdomen. We are surprised to find no reference to Volkmann's contracture, which might surely have furnished the author with opportunities to display his skill and resourcefulness.

As a record of actual experience this book will be of the greatest use to surgeons who are engaged in treating such lesions as it describes.

PSYCHOTHERAPY.

Principles of Psychotherapy. By Dr. PIERRE JANET, Member of the Institute, Professor of the Collège de France. Translated by H. M. and E. R. GUTHRIE. London: George Allen and Unwin. 1925. Pp. 322. 10*s*. 6*d*.

As a descriptive psychopathologist Janet is unrivalled, though even in his own country the value of his clinical work is not fully recognised, and whilst we are aware of the modern "plague of nerves" we do not profit by his teachings to investigate properly the symptoms of those smitten by the plague. His theory of the dissociation of consciousness provided, both for the manifestations of hysteria and for psychological automatisms, a unifying conception which held the field till the more dynamic theory of the unconscious seemed better to satisfy our craving for explanations in terms of cause and effect. But, though Janet shows the theory of the unconscious to be in the direct line of descent from the observations of Charcot and himself at the Salpêtrière, yet he summarily rejects this later development and places psycho-analysis in the same category as animal magnetism. A third of the book is given to a history of psychotherapies, from the religious treatments like those that made famous the temple of the Asclepieion, through the practices of the animal magnetists to those of the hypnotists, to the methods of Christian Science and the moral suasion of Dubois. Running through all these Janet sees a constant trickle of therapeutic success, but superficial and inexact interpretations have stopped the evolution of processes of treatment that in themselves possessed usefulness and power. Janet's own interpretation of psychopathological disabilities depends upon a postulate of "psychic tension" and the belief that by proper stimulation this tension can be raised or that by economy the "psychic income" can be made sufficient for the needs of life. He notes the importance of "influence" in treatment, and from the practical aspect his methods consist in a thorough understanding of the patient with deliberate guidance and encouragement when the influence is established. As was to be expected, the book is full of shrewd observation, but the reader who comes to it with the hope of learning easy methods of psychotherapy will be discouraged. Janet is cautious as well as experienced, as he shows in writing: "It is not enough for such patients to give them advice or to correct a fault. Patients who have disorders of intelligence, belief, or will, must be made to understand such advice, made to accept it, made to carry it out. This is something very different, and the treatment remains for the most part a problem of psychology."

The book is translated into English which is on the whole easy although there is an occasional obscurity of meaning.

Collected Papers. Vol. III. By SIGM. FREUD, M.D., LL.D. Case Histories. Authorised translation by ALIX and JAMES STRACHEY. London: The Hogarth Press and The Institute of Psycho-Analysis. 1925. Pp. 605. 30*s*.

THERE are difficulties peculiar to the writing of histories of cases treated by psycho-analysis. The intimacies of the patient's life are so closely concerned that everything leading to identification must be withheld or disguised; no close record can be kept of the analytical findings; links in important chains are so scattered that to join them involves a re-setting of the material; and, finally, the full report of a single analysis would be too voluminous for publication. Pleading these and other difficulties, Freud makes here no attempt to produce conviction in the minds of sceptics, but writes for the information of investigators already convinced by their own experience. The first of the five cases described is one of typical hysteria showing dyspnœa, nervous cough, aphonia, and migraine, with depression and hysterical unsociability, and these commonplace symptoms

were bound up with an involved history of emotional events the description of which, with a running commentary, occupies over a hundred pages. The much criticised *Analysis of a Phobia in a five-year-old Boy* follows, with a postscript telling that both phobia and analysis were forgotten by the subject at the age of 19, when the account of his own case came to him as something novel and unknown. To the clinical psychologist the obsessional neuroses are, perhaps, the most interesting of the psycho-neuroses, though their presence is often unrecognised, since the obsessional patient, unlike the hysteric, tends to hide his symptoms from the world in general and his medical adviser in particular. Analyses of two cases are described and, even in their abridged form, they well indicate the complexities of the fantastic logic of the unconscious. More inferential is the application of psycho-analytical principles to elucidate the autobiography of a paranoiac.

The volumes of this series are in historical and logical sequence and should be read in their order of publication. The present one marks a stage at which the general reader can still cope with the difficulties of the subject, though it naturally appeals more to those engaged in treatment.

Problems of Personality. Studies presented to Dr. MORTON PRINCE. By Various Authors. London: The International Library of Psychology, Philosophy, and Scientific Method; Kegan Paul. New York: Harcourt, Brace and Co. 1925. Pp. 434. 18*s*.

Dr. Morton Prince is an American pioneer of psychopathology, best known by his studies of dissociated personality and by his views on the psychogenesis of epilepsy, and a bibliography at the end of this book enables one to trace the development of his interest in general medicine through neurology to the field of psychology and psychopathology. The contributors to this *Festschrift* write with authority in their own spheres, and within the one book the editors have brought together widely divergent views that in this case indicate the growing point of a vigorous branch of knowledge. In the list of writers of the 24 papers the names of Janet, Ernest Jones, Jung, and Putnam mark its international character, and we are reminded that while MacFie Campbell and William McDougall have left this country to take up academic posts at Harvard, the United States has given in exchange John T. MacCurdy to Cambridge University.

Problems of personality involve so many aspects of human behaviour that there is of necessity an absence of continuity of subject. Papers on witchcraft and on medico-legal experiences, on the signatures of Shakespeare, and on the association of psycho-neuroses with mental deficiency, find place under the title of "Abnormal Psychology and Psychopathology," and under the heading of "Unconscious Dynamics and Human Behaviour," Dr. Ely Jelliffe makes an important contribution to the study of unconscious processes in their relation to clinical conditions. Papers by Dr. Knight Dunlap and Dr. H. H. Goddard attack the concept of the unconscious, and Dr. McDougall vigorously criticises Freud's views on social psychology, whilst the psycho-analytical side is represented by MacCurdy and Ernest Jones. It is gratifying to find the psycho-analytical controversy handled upon a scientific plane.

The general reader may find it difficult to estimate the relative values of the views expressed in this book; the psychologically trained reader who feels more confident may bear in mind the warning of MacFie Campbell on page 74: "We are too much accustomed to think that there is only one correct way of dealing with experience, and that the angle, from which we personally come to experience, is the only one from which it can be approached." To both the general and the specialist reader the book can be recommended; it shows that we have travelled far since psychology was described as "the definition of the obvious in terms of the unintelligible."

OPHTHALMOLOGY.

Iris and Ciliary Body. Sémiologie Oculaire. Le Diaphragme Irido-ciliare. By Prof. FELIX TERRIEN, Ophthalmic Surgeon, Beaujon Hospital, Paris. Paris: Masson et Cie. 1924. With 126 illustrations. Pp. 240. Fr.25.

WE have here the second part of a work planned on a generous scale to include not only the symptomatology, but the anatomy, physiology, pathology, and to a partial extent the treatment of the entire eye, details of operative treatment alone being excluded. The first part ("La Calotte Cornéo-scleral") has already been reviewed in these columns,[1] and the remarks then made on the difficulties of considering separately the diseases of the various structures which make up the eye are equally applicable here. Nevertheless, an exhaustive study of the iris and ciliary body, such as this book gives, will be a valuable addition to any ophthalmological library.

In many places the book reflects views current in France and not in this country. Prof. Terrien retains the term rheumatic iritis, which in England has almost gone out of fashion, but he adds that perhaps many cases of rheumatic iritis should be attributed to a latent tuberculosis. In this country we are accustomed to think more of a latent gonorrhœa or of septic infection from the teeth. Tuberculosis of the uveal tract is well illustrated and on the subject of treatment we note that the author almost wholly rejects the use of tuberculin. When we employ tuberculin, he says, in doses so small as certainly to avoid any focal reaction, we deprive that substance of any therapeutic value. On the subject of sympathetic ophthalmia we miss any reference to the characteristic cells infiltrating the choroid described by Fuchs. The author considers favourably the idea that it is a local manifestation of anaphylaxis. In the section on glaucoma, which is included in this volume, the English reader will remark the small place allotted to perimetry as a method of diagnosis, and that in treatment by sclerectomy prominence is given to the method of Lagrange, not to that of Elliot. There are some interesting sections showing retinal atrophy caused by prolonged high tension.

The book is beautifully illustrated, more notable figures being a section of the ora serrata, showing the transition from the functional to the ciliary retina, a syphilitic granuloma at the root of the iris and sections showing the results of an experimental injection of gonococci into the anterior chamber, and demonstrating the beneficial effects of an injection of anti-gonococcal serum.

Medical Ophthalmology. Second edition. By R. FOSTER MOORE, O.B.E., F.R.C.S., Assistant Ophthalmic Surgeon, St. Bartholomew's Hospital; Surgeon, Moorfields Eye Hospital. London: J. and A. Churchill. 1925. With 8 plates and 93 illustrations. Pp. 344. 18*s*.

Mr. Foster Moore's book is considerably expanded since the publication of the first edition in 1922. The whole has been thoroughly revised and there are several new sections. Defect of the visual fields due to lesions of the temporal lobe is a comparatively new subject. There is a diagram showing how the ventral part of the optic radiations plunges first forwards from the external geniculate body into the temporal lobe and then backwards to the calcarine cortex. Intracranial aneurysms causing subarachnoid hæmorrhage are dealt with, and the various ocular symptoms thereby caused, including papillo-œdema and retinal hæmorrhages. Another addition is a section on juvenile and adolescent forms of cerebro-macular degeneration. One of the most interesting additions is a section on the Argyll Robertson pupil from causes other than syphilis. It is based on an original report of the author's on seven cases with Argyll Robertson

[1] THE LANCET, 1923, ii., 334.

pupils in whom most careful investigation failed to reveal any evidence of syphilis, or nervous or other disease of any kind. In certain cases it appears to be congenital and a quite isolated phenomenon. According to Kinnier Wilson, it is an occasional occurrence in diffuse toxi-infective states other than neuro-syphilis.

As in the first edition, the most interesting and original parts of this work appear to us to be those concerned with retinal arterio-sclerosis and renal and other forms of retinitis. These are especially well illustrated. We know of no other book where the relations between the ophthalmoscopic appearances and microscopic findings in these diseases can be so well studied.

LECTURES ON DISEASES OF CHILDREN.

Fifth edition. By ROBERT HUTCHISON, M.D., F.R.C.P., Physician, London Hospital, and Hospital for Sick Children, Great Ormond-street. London: Edward Arnold. 1925. Pp. 459. 21*s*.

THE fifth edition of Dr. Hutchison's lectures contains new material which adds considerably to the ground which they cover, while the individuality of the book has been preserved. Minor alterations have been made throughout the text, but the principal additions consist of five new lectures, dealing with acute rheumatic carditis, affections of the liver, the solitary child, abdominal pain, and disorders of growth and development. A new chapter is devoted to convulsions, which no longer appear among the functional disorders. New elements are introduced in the review of the ætiology of rickets. Dr. Hutchison has modified his view of the transmission of syphilis which he now regards as maternal and usually placental. In the treatment of tuberculous peritonitis he favours early surgical measures for all ascitic cases. The new lectures are characterised by the same lucid and homely style as the older ones. The lecture on the problem of the solitary child should be of particular value in directing attention to an aspect of children's disorders which is too commonly neglected.

The popularity of this book among students and practitioners will certainly be maintained by the new edition.

ORGANOTHERAPY.

Opothérapie Clinique; Organothérapie; Formulaire. By MARCEL LAEMMER. Paris: Masson et Cie. 1925. Pp. 151. Fr.10.

Opothérapie Endocrinienne. By GUY LAROCHE. Paris: Masson et Cie. 1925. Pp. 256. Fr.12.

THESE two books, so similar in title and appearance, are very different in content. Dr. Laemmer's book is that of an enthusiast, who is devoted, perhaps on account of some early successes, to treatment by glands and internal secretions, and who applies such treatment for all sorts of diseases. This enthusiasm carries himself and probably many of his patients to believe that material benefit is derived. To any doctor who thinks that bone-marrow, placenta, lung, breast tissue, given by mouth will improve his patient, this book will tell the dosage and method of giving. We cannot, however, avoid a suspicion that the doctor is more at the mercy of the manufacturer than Dr. Laemmer believes.

Dr. Laroche's book, on the other hand, while lacking enthusiasm, brings us in closer touch with modern ideas. It gives in fact a clear exposition of what is now generally believed. After some general remarks, the author gives a useful chapter on the methods of preparation used in making glandular products for medicinal purposes. He then takes each gland in turn, beginning with thyroid medication, and ending with insulin and polyglandular treatment. Each is discussed well and without bias, and the book sums up ably the present position of glandular treatment, or as the French prefer to call it, opotherapy.

DIABETES AND INSULIN.

Insulin. Darstellung, Chemie, Physiologie und Therapeutische Anwendung. Second edition. By Dr. H. STAUB, Privatdozent, 1 Assistent der Med. Klinik in Basel. Berlin: Julius Springer. 1925. Pp. 177.

IT is only a year since the first edition of this book was published and the necessity of a second edition, which is nearly double the size of the first, is a sign of the amount of new work which has been published as a result of the discovery of insulin. Dr. Staub gives a good account of the physiology of the diabetic condition and of the various efforts to discover the internal secretion of the pancreas, some of which only just missed success. The different methods of preparation of insulin are described, and the striking improvements in its manufacture are brought out. The known properties of insulin are enumerated, and the numerous experiments detailed which have helped to elucidate the problems. This part of the book will be valuable to other workers on this subject, since the arguments and experiments are fully discussed and abundant references are given. The clinical section of the book suffers a little by comparison, but mainly because the clinical problems are more difficult. The different methods of treatment are set out together with the ideals to be aimed at, and the indications and contra-indications found in practice. The absence of an index is to be regretted.

Die Insulinbehandlung bei Diabetes Mellitus. By Dr. H. STRAUSS and Dr. M. SIMON. Berlin: S. Karger. 1925. Pp. 74.

THIS is the third edition of a pamphlet which appeared two years ago. It opens with an adequate account of the discovery, properties, and manufacture of insulin, and then goes on to the description of its clinical usage. The authors do not use insulin in mild cases, regarding it as a luxury except in special circumstances. For the moderately and very severe cases they regard it as invaluable, although it has made the dietetic problem much more difficult. An account is given of the Hagedorn and Jensen method for estimation of blood-sugar, which is in many ways the most suitable for hospital work. The account of the theory of insulin action contained in the last 15 pages is too condensed to be clear.

Diabetes Mellitus and its Dietetic Treatment. Thirteenth edition. By B. D. BASU, Major I.M.S. (Ret.) Allahabad: Panini Office. 1925. Pp. 94. Rs.2.

THIS discursive little book contains details of diabetic cures with various carbohydrates. The short account of insulin which, as the preface states, has been embodied in the new edition consists of 15 lines and is hardly adequate. The fasting treatment is dismissed in four pages, and is followed by two pages on the cocoanut cure.

EVOLUTION, HEREDITY, AND VARIATION.

By D. WARD CUTLER, M.A., Chief Protozoologist to the Rothamsted Experimental Station, Harpenden. London: Christophers. 1925. Pp. 147. 4*s*.

THE importance of modern biology to medicine is not properly appreciated, and the medical implications of the subjects dealt with in this book have hardly begun to be explored. It must surely be as necessary that the ordinary medical student should know about Mendel and the normal curve of variation, as that he should be aware that salt is made up of sodium and chlorine. Medicine consists of individual cases, but medical science badly needs, as Mr. Yule reminded us lately, to think at least in terms of averages, better still in terms of distributions. Mr. Cutler has written quite a good introduction to evolution and heredity, and the publishers have made it available at a really

modest price. The historical part in which the evolution of Evolution is traced with interesting personal touches is particularly well done. Thereafter there is rather too much Mendelism and rather too little Galtonism. It may be true that continuous variations arise from a multiplicity of Mendelian factors. On the other hand it may not, and in any case the impossibility of subjecting characters beyond a certain degree of complexity to factorial analysis makes it difficult to be sure about it. There is still plenty of room for looking at the world in Prof. Karl Pearson's way, as well as in Professor Bateson's. But the book will serve as an excellent introduction to the subject, though pathologists will wonder what the author is talking about in the paragraph headed "Blood Tests" (p. 32). If it is meant to be a summary of Nuttall's work on precipitins, it is as strange a travesty as there ever was, and it suggests that, if it would do medical men good to know a little more about Mendel, it might do protozoologists good to know a little more about immunology.

CLINICAL PSYCHOLOGY.

By LOUIS E. BISCH, M.D., Ph.D. London: Baillière, Tindall and Cox; Baltimore: Williams and Wilkins Company. 1925. Pp. 346. 15*s*.

As its name implies, this book deals with methods of mental examination of patients suspected of subnormality or abnormality. The author's scheme of examination is, as is usual with American investigators, elaborate in the extreme, pursuing every possible detail of personal, family, and social history, and including full inquiry into environmental conditions besides the actual personal interview and the use of intelligence and pedagogical tests. It is not suggested that one person should be responsible for all parts of the investigation, but the author is emphatic that the evaluator of the available data should be a medical expert with special training, an opinion which coincides with English practice, although the special training may still be somewhat less complete than is desirable. Most examiners will probably have to be content with a less comprehensive scheme than the book gives. It is fairly certain that much of the information asked for will be unobtainable or inaccurate, and it is also questionable if some of the details inquired into throw much light upon the mentality of the patient.

The rest of the book is essentially a text-book of mental deficiency, but special chapters are included on the epileptic, the syphilitic, and on functional conditions. On the whole the treatment is somewhat superficial: a chapter on the precocious child, which we should be disposed to welcome as a novel feature of such a book, is singularly unilluminating. A useful section distinguishes constitutional psychopathic states, including emotional instability, pathological lying and wandering, from amentia on one hand and insanity on the other. Here again we could have wished for fuller treatment. The author's attitude to the problem of the "moral imbecile" is that of most modern psychologists, who relegate it, rightly or wrongly, to the limbo of forgotten things. Heredity is cursorily dealt with, and it is surprising that, in a book in which Dr. A. F. Tredgold is so frequently quoted, his theories on this subject are completely ignored.

With regard to mental testing, the author advocates the use of certain performance tests, in addition to the Binet-Simon scale, in order to assess intelligence, and is careful to warn his readers that interpretation of tests is even more important than the actual results, a warning that is still necessary. A useful appendix gives complete descriptions of a large number of cases of all types, including some normals and super-normals in intelligence, well worth study by those who are commencing mental testing. The book contains a few good plates, which might have been increased in number, and are not well placed in the book.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT BATH.

SECTION OF PATHOLOGY AND BACTERIOLOGY.

(*Continued from p. 248.*)

THURSDAY, JULY 23RD.

THE PATHOLOGICAL BASIS OF TREATMENT BY RADIATION.

THE discussion on this subject was opened by Prof. Sidney Russ, who said that the most important therapeutic use of radium and X rays was in the treatment of malignant disease, whilst surgical tuberculosis and the deficiency diseases were those most susceptible to light and ultra-violet therapy. In the laying down of the pathological foundations of such therapy it was necessary not only to specify the cellular changes resulting from irradiation, but also to correlate them with the dosage employed and to indicate the processes by which the changes are brought about. The degree to which visible and ultra-violet radiation penetrated the tissues was small; it became, in fact, gradually smaller and smaller as pigmentation due to this exposure increased, and there was a natural tendency to attribute the reactions which occurred to some effect set up either in the blood-stream or the lymph, or to suppose that the nervous system played some important though obscure part. The pathological basis of heliotherapy was not so well defined as that of treatment by X rays and radium. Pathological researches had shown that cellular degeneration was a frequent sequel to irradiation of tissues. These changes might be due either to a direct action of the radiation upon the internal constituents of the cell, or to a direct action of the radiation upon the interfaces of the cell, or to an indirect action which irradiation initiated. Prof. Russ said that he would like to hear these alternatives discussed—his own views inclining him to the opinion that some interfacial action plays the dominant part in the first instance. Considering the tissues as systems involving a continuous adjustment of their equilibrium, he thought that the upset of such equilibria was more likely to have a profound effect upon the composite mass than the actual breaking down of the chemical complexes within the cell. In tissue clearly damaged by radiation we had evidence of the whole equilibrium being upset. In tissue submitted to doses which had no visible effect whatever we had the equilibrium entirely conserved, as it was towards visible radiation, and in those cases where only slight visible effects were produced; yet with integrity of the structure we might perhaps look upon them as stable yet entirely new conditions of equilibrium. Various tissues responded differently to a dose of radiation according to whether the time of exposure was short, the quantity being large; or long, the quantity being small. It was still obscure why there should be a difference in the reaction of the tissues when the actual dose was constant, the only variation being in the conditions of exposure. The effects of radiation on the tissues were unique. In living tissues we were confronted with a complex continuously adjusting its equilibrium with contiguous or enveloping structures, and experimental methods would appear more likely to reach success if the complex were kept in mind without the effort of reducing it to simple terms.

Dr. T. S. P. Strangeways gave a description of the effect of irradiation by X rays on cells undergoing division in tissue cultures of the embryonic fowl and on the embryo while in the unopened shell. The effects were observed during experiments which are being carried on by himself and his co-workers, Dr. R. G. Canti, Dr. M. Donaldson, Prof. Hopwood, and Dr. F. G. Spear. These experiments indicated that even small doses had a pronounced inhibitory effect on cell division and that they prevented new

cells from coming into mitosis. Such small doses caused a definite retardation of the different phases of mitosis in those cells which had already begun to divide before the commencement of irradiation. It was found that there was no definite evidence that cells in actual mitosis were more vulnerable than those in a vegetative state. It was further found that, within the limits of the experiments, variation in the quality of the incident dose of X rays as measured by a Friedrich iontoquantimeter had no appreciable influence on the dose required to prevent mitosis.

Miss E. M. Hume read a paper on the

Action of Ultra-violet Light upon the Growth of Rats,

in which she described experimental work which proved that light cannot substitute cod-liver oil indefinitely for the growth and well-being of the rat. Although calcification may be promoted by the light, yet the set of symptoms due to injury to the mucous membrane eventually display themselves and lead to a fatal issue. It appears that some reserve is gradually exhausted. Possibly this other limiting factor is the original vitamin A, though how far this is completely independent of the light or antirachitic factor cannot at present be determined. The nature of the antirachitic vitamin or of any inactive precursor substance is at present uncertain; it appears to be fat-soluble; but it is not even proved that there is one specific substance. Antirachitic properties have been conferred upon various inactive substances by exposing them to ultra-violet radiation, and when fed to rats they produce the same effect as does direct irradiation.

Dr. A. Piney spoke on changes in the blood and blood-forming organs following exposure to X rays. On the bone marrow the effects are essentially destructive in character, and are seen in the shape of nuclear degeneration of the essential cells, although there is no change in the adipose tissue. In the lymphatic glands the results of radiation resemble those due to inanition, but occur much more rapidly. The involution of the thymus resulting from X rays is rapid and extreme. The changes in the spleen are more difficult to interpret because considerable variations occur in response to different doses. Ziegler was able to show that, if the dosage were so adjusted as to injure the Malpighian bodies without damage to the pulp, it was possible to demonstrate the occurrence of myeloid metaplasia in the latter structure within a few days. In the blood the great majority of investigators have shown that there is a distinct reduction in the number of leucocytes, which depends mainly upon decrease of the neutrophiles with consequent relative lymphocytosis. The basis of the changes occurring in the blood is still a matter of controversy.

Dr. R. G. Canti and Dr. F. G. Spear discussed the

Biological Action of Gamma Ray Irradiation on Tissue Cultures.

The experiments were undertaken as a result of certain observations on the effects of radium irradiation on cases of carcinoma of the cervix treated by Dr. Malcolm Donaldson. Most striking among these observations was the absence of mitosis which was observed as soon as the radium was removed after 24 hours in situ. The preliminary observations on tissue cultures were purely qualitative. Living cells were examined in the thermostat for prolonged periods under the microscope whilst under the influence of radium. The following conclusions had been reached: (1) Cells in mitosis divided in what appeared to be normal fashion and the daughter cells developed into full-sized apparently normal vegetative cells and did not again go into mitosis. (2) For a certain period, the length of which depended on the intensity of irradiation, cells continued to come into mitosis as before irradiation, but at the end of this period no more cells came into mitosis.

After satisfying themselves that radium irradiation brought about very definite changes in the cultures, they had undertaken quantitative experiments with a view to determining whether the same amount of irradiated energy brought about the same biological effects irrespective of the time over which that energy was radiated—i.e., if the radium were moved further from the tissue culture to a distance whereby the incident intensity were halved, then would double the time be required to produce the same biological effect? The physical measurements of intensity of radiation at various distances were made by a photographic method, and curves were drawn up comparing the physical effects with the biological effects as determined by the time taken at various distances to cause cessation of mitosis. These curves showed that when the radium was near the tissue culture there was no observed departure from the physical readings, but that at a greater distance a longer time was required to bring about the same effect than would be anticipated from purely physical laws. Further, the shape of the biological curve suggested that beyond a certain critical distance from the radium no biological effect might be expected. It was pointed out that, at this stage of the investigation, this course of events could not necessarily be translated into conditions when radium is applied to carcinoma in vivo.

A paper was read by Dr. Helen Mackay on

Foodstuffs Irradiated with Ultra-violet Light

and their effect on the bone lesions of rachitic children. Dr. H. F. Shaw had collaborated in this work, and he showed a number of lantern slides of X ray photographs. Their experimental work led them to the conclusion that the effect of direct exposure to ultra-violet light on the bone lesions of a rachitic patient appear to be dependent upon the power of light to produce in certain substances the so-called antirachitic factor. Rapid healing of the bone lesions in children can be brought about by dried milk irradiated with ultra-violet light from the mercury arc, and this antirachitic potency of the milk withstands ten minutes' boiling. Three ounces daily of white flour similarly irradiated had little or no effect, and the antirachitic power of 6 drachms daily of irradiated cotton-seed oil is probably slight. There is reason to believe that a prolonged exposure to ultra-violet light will destroy the antirachitic potency a shorter exposure has imparted. It seems probable that the action of a foodstuff artificially rendered antirachitic by irradiation with ultra-violet light is identical with the action of a naturally occurring foodstuff containing the antirachitic factor, and that no more beneficial effect is to be expected from irradiating a patient's milk than from giving cod-liver oil. But when cod-liver oil cannot satisfactorily be given then irradiated substance may in the future prove of considerable value.

At the conclusion of this communication an opportunity was given for questions to be addressed to the readers of papers, and the following took part in the subsequent discussion: Dr. J. Barcroft Anderson Dr. Braxton Hicks, and Prof. J. C. G. Ledingham.

FRIDAY, JULY 24TH.

THE PRESENT POSITION OF PATHOLOGY AND BACTERIOLOGY IN THIS COUNTRY WITH SPECIAL REFERENCE TO RESEARCH.

In opening a discussion on this subject the President of the Section, Prof. J. C. G. Ledingham, remarked that in the last annual report of the Medical Research Council the parts played respectively by physiology, pathology, bacteriology, biochemistry, and experimental medicine in contributing to the general advance of practical medicine in this country were discussed at considerable length. The report recorded praiseworthy progress in the fields of physiology, but found little to place to the credit of pathology and bacteriology during the last five years. This apparent sterility was attributed to the stated fact that the purely utilitarian side of pathology and bacteriology has lessened the opportunities of their exponents for contributing to the advance of new knowledge, and in some cases tended to withdraw from active

research life workers who might otherwise have added to knowledge. Those universities were criticised which maintain the departments of pathology and bacteriology from fees received for the routine performance of diagnosis tests made on behalf of outside bodies. Prof. Ledingham agreed with the report of the M.R.C. that these practices are liable to grave abuse, and that immediate reform is necessary in the best interests of pathology, but declared that the place which routine diagnosis takes in the training of the professional bacteriologist cannot be ignored. Routine diagnosis is an excellent training for research; but when the research stage is reached routine diagnosis should not be allowed to interfere with the new interests. The best pathological service can be realised only when ward and laboratory and patient or laboratory are brought as near as possible, and mutual consultation on equal footing can be arranged. The inspiration to research need not of necessity be subdued in the atmosphere of routine work; but the research output might be very considerably increased if the training of men for professional routine pathology and bacteriology were more carefully organised. Bacteriology must be recognised as a broad and fundamental branch of science, coördinate with, rather than subordinate to, the other great divisions of biology. Therefore the universities should train the graduate aspiring to become a professional bacteriologist by providing advanced instruction in general bacteriology. Though posts for bacteriologists have increased of recent years there appears to have been no corresponding increase in the field of suitable candidates. There are welcome signs that increased facilities for training pathology laboratory workers may soon be available. Prof. Ledingham passed on to consider the research institutes, which occupy a somewhat different, but not essentially different, position from that of the universities. Since all the ancillary sciences which minister to medicine are usually represented in the institute, the staff forms a self-contained unit. Experience has shown that pathology and bacteriology, research in serum-therapy and specific disease prevention, supply a constant stream of problems which may or may not have their immediate echo in practical medicine. Occasions arise, however, when the direct appeal to the human patient becomes insistent; and both the Pasteur and Rockefeller institutes have made provision for this by the establishment of research hospitals. At the Lister Institute, Prof. Ledingham remarked, a site is ready for a research hospital when the necessary funds can be obtained.

In spite of the handicaps under which these sciences labour in this country at present, how far is the criticism expressed in the M.R.C.'s report justified? Prof. Ledingham considered that the author of the M.R.C.'s report was unwise in attempting an estimate of the achievements over a short period of pathology and bacteriology as compared with those of physiology and biochemistry. He declared that some of the arguments advanced to support the points were founded on irrelevant or inaccurate statements, and he concluded an eloquent appeal for a less materialistic attitude with these words: "If bacteriology fails in five years to throw up an attractive flower, heaven knows that in the past 40 years it has thrown up many. Let it rest for a while in the apparent slumber of growth and rejuvenescence, working out anew its fundamental problems in activities which do not attract perchance the attention of the superficial observer."

Prof. M. J. Stewart (Leeds) said that he found himself fully in sympathy with Prof. Ledingham's point of view. He spoke in particular of the training of young pathologists, observing that this required the abundant supply of pathological material for their instruction. There was usually little difficulty in imparting to a promising laboratory worker sufficient skill to carry out routine work; but often he lacked that broad fundamental training in mathematics, physics, and chemistry which would enable him to tackle with success the great problems of disease still awaiting solution. But facilities for better training were increasing. Thus the University of Leeds offers a four years' course leading to the degree of bachelor of science with honours in bacteriology. Within recent years there had been a revival of interest in morbid anatomy, and the prophecies of its decline had not been fulfilled. He thought that the study of morbid anatomy would be advanced if the teacher of histology approached the subject from the pathological point of view. Turning to the criticisms expressed in the last annual report of the Medical Research Council, he said he did not agree, among other points, with the wholesale ban on routine work therein pronounced. He pointed to an inconsistent attitude on the part of the author of the M.R.C.'s report to pathology and physiology. He concluded by entering a plea for a much maligned side of the pathologist's work—namely, "dead-room pathology"—and declared that the post-mortem room still provided an invaluable and almost inexhaustible field for original research.

Prof. Carl Browning (Glasgow) spoke particularly of the training of research workers, the facilities for research, and the endowment of research. After medical training he thought it to be of the greatest advantage to the pathologist to hold for several years a whole-time research fellowship. On the subject of facilities for research he considered it to be not excessive if every member of the staff of every pathological department had at least half of his working time free to devote to research work. He deplored the neglect of the facilities which exist at fever hospitals for the study of infectious disease, and appealed for a closer association of research in animal and human pathology.

Speaking of the endowment of research, he agreed that the M.R.C. had given almost inestimable assistance by paying both for personnel and material, but considered that endowments should be provided without the fettering condition of this being applied solely to the investigation of some particular specified problem or disease.

Dr. Braxton Hicks, Dr. J. A. Arkwright, Dr. C. C. Okell, and Dr. C. E. Dukes contributed to the discussion. In summing up, Prof. Ledingham said that he hoped that steps would be taken to bring the unanimous conclusions of the pathological section of the B.M.A. to the notice of all universities and hospitals of the country.

EXHIBITION OF INSTRUMENTS, DRUGS, FOODS, AND APPLIANCES.

SURGICAL INSTRUMENTS AND APPLIANCES.

THIS year sees the addition of much interesting surgical apparatus to the range shown in 1924.—[46] Allen and Hanburys, Ltd. (Bethnal Green, London, E.C. 2), showed various improvements in the St. Bartholomew's Hospital pattern operation table of last year, and a new horizontal model high-pressure steriliser, in addition to a wide range of instruments for general and special surgery.—[38] Arnold and Sons (John Bell and Croyden, Ltd., 50, Wigmore-street, London, W. 1): a new operation table fitted on double cylinder oil pump base and improved movement for raising and lowering the head and leg pieces, and a selection of surgeon's instruments made entirely of Firth's stainless silver steel. Their "Electrophonoide," an apparatus for re-educating the sense of hearing, was also being demonstrated.—[50] Down Bros., Ltd. (21, St. Thomas's-street, London, S.E. 1) showed a collection of surgical instruments and appliances.—[44] The Holborn Surgical Instrument Co., Ltd. (26, Thavies Inn, London, E.C. 1) had a large collection of hospital furniture and instruments, including a new pedestal operation table, Cumberbatch and Robinson's diathermy electrodes, and the "Jupiter" sun lamp.—[43] Mayer and Phelps (59, New Cavendish-street, London, W. 1): a selection of instruments and appliances, particularly the "Reavell-Moseley" electric rotary pump, for pressure and suction, which can be used to administer

anæsthetic vapours, to work sprays, evacuate cysts, or to remove blood and secretions from an operation area, thus saving much time in swabbing; also a complete set of instruments for per-oral endoscopy by Irwin Moore, so arranged that the tubes can be used for either proximal or terminal illumination; an artificial larynx by Tapier, and a selection of tubes for use after total laryngectomy; Hammond's combined urological syringe for local anæsthesia or hypodermic, intramuscular, or intravenous injection, for lumbar puncture, and for injecting the anterior and posterior urethra and the pelvis of the kidney; also the "Chiron" ring pessaries.—[40] John Weiss and Son, Ltd. (287, Oxford-street, London, W. 1): a complete display of general surgical instruments, including the Vaquez-Lanbry sphygmotensiophone; Ryall's cysto-urethroscope and combined cystoscopic lithotrite; Sinclair's intracapsular forceps and outfit, and a projection and operation lamp suitable for any voltage, with water-filter attachment for demonstrating microscopic slides.—[41] Hoskins and Sewell, Ltd. (Bordesley, Birmingham): an obstetric bed designed by Dr. Remington Hobbs for drainage treatment. This is made in separate halves, each having four legs and wheels; the foot end can be pulled away and stirrups put in the other half, minimising disturbance of the patient; a number of patent wheeling bedsteads particularly adapted to the open-air treatment of tuberculosis; the Alton sunshade for the head and shoulders of a patient receiving sun treatment.

Among the special instruments:—[2] G. H. Zeal, Ltd. (75, St. John-street, London, E.C. 1): the "Repello" clinical thermometer, which is reset by pressing a top bulb and requires no shaking. The "Acello re-setting" clinical thermometer case, for those who find it difficult to shake the ordinary thermometer; and an aseptic thermometer with graduations on the glass outer case and an unmarked stem, which is unharmed by any antiseptic solution.—[12] Theodore Hamblin, Ltd. (15, Wigmore-street, London, W. 1): a collection of ophthalmic instruments and equipment, including the new Lister hand-projection lamp for operating; a new luminous Morton ophthalmoscope for use with direct and indirect methods; a new astigmatic test with grey background and an improved form of the Lister perimeter and scotometer. They had also on view a series of drawings and lantern slides of eye conditions, made by their staff of trained draughtsmen.—[13] The Genito-Urinary Manufacturing Co., Ltd. (64, Great Portland-street, London, W. 1): a selection of all the latest instruments of bladder and kidney surgery, and particularly a series of diagnostic instruments not previously manufactured in this country.—[29] The British Hanovia Quartz Lamp Co., Ltd. (Slough): their quartz mercury anode type lamps, for direct current and alternating current without rectification.—[30] The Dowsing Radiant Heat Co., Ltd. (91, Baker-street, London, W. 1), showed an improved pattern of the Sunrae carbon arc lamp for ultra-violet radiation; an improved bed and lighter local appliances, and a bed-warmer fed from the house supply.—[31] Rayner and Keeler, Ltd. (Kemp Town, Brighton): various operating lamps and ophthalmoscopes, particularly a triple-beam operating lamp minimising shadow, an adjustable ophthalmic bracket fixed above the patient's head, and a slit-lamp with single focus for microscope and lamp; also Dr. R. Wallace Henry's new light perception instrument which was demonstrated at the Sectional Meeting.—[33] Hague and Son (32, Broad-street, Bath): ophthalmic instruments, including the Zeiss simplified Gullstrand ophthalmoscope and the Zeiss parallax refractometer, embodying slit-lamp and ophthalmoscope.—[45] The Inhaling Drug and Apparatus Co. (30, Grosvenor-place, London, S.W. 1): the Apneu inhaling apparatus (Spiess Drager), which transforms any liquid into an infinitely fine vapour for inhalation. Drugs, including insulin, may be administered through the respiratory organs by this means, reaching the circulation more rapidly than by hypodermic injection.—[52] H. E. Curtis and Son, Ltd. (7, Mandeville-place, London, W. 1): a series of abdominal supports and colostomy trusses, and a medicinal liquid paraffin "Colonol."—[62] General Acoustics, Ltd. (77, Wigmore-street, London, W. 1): the latest aids for the deaf, electrical and non-electrical, including a new microphone encased in light imitation tortoise-shell, giving a mellower sound; and a special theatre-box that enables the deaf to hear loud speakers as well as plays, speeches, and sermons.—[86] Ardente-Acoustique (95, Wigmore-street, London, W. 1): the new 1925 types, a distinct advancement on previous models with complete freedom from metallic or extraneous sounds.—[69] Pedestros, Ltd. (10, Conduit-street, London, W. 1): "Desoutter" light metal artificial legs for all types of amputation.—[84] B. Smith (6, Cambridge-terrace, Widcombe Hill, Bath): a series of adjustable aluminium limbs, splints, and calipers for bone-grafting, &c., with special apparatus for rapid lengthening and shortening; also a showcase of photographs of wounded men fitted with artificial limbs and appliances at the Bath War and Ministry of Pensions Hospital, 1915–22.

Other firms supplying surgical dressings:—[7] Antiphlogistine (Denver Chemical Manufacturing Co., London, E.C. 3) and [5] The Thermogene Co., Ltd. (Haywards Heath, Sussex) were demonstrating their well-known products.—[4] Fassett and Johnson, Ltd., were showing a full range of Seabury and Johnson plasters, dressings, and surgical requisites, including Mead's rubber adhesive plaster and the "Gold Cross" absorbent cotton.—[16] Jeyes' Sanitary Compounds Co., Ltd. (64, Cannon-street, London, E.C. 3): various preparations of cyllin, an antiseptic which has a Rideal-Walker coefficient for *B. typhosus*, 24–26.—[37] The Jaeger Co., Ltd. (95, Milton-street, London, E.C. 2): a selection of underwear and outerwear for men, women and children; also the "Domen" belts for pregnancy, hernia, and floating kidneys.

DRUGS AND PHARMACEUTICAL PREPARATIONS.

[46] Allen and Hanburys (37, Lombard-street, London, E.C. 3): in addition to the well-known "Byno" and "Polyglandin" preparations, the "A. B" brand of insulin, "Osmo" Kaolin, a specially purified colloidal kaolin, prepared by electro-osmosis and used in the treatment of intestinal toxæmias; "Sea-cones," suppositories containing chloral hydrate and bromide, for sea-sickness; "Iodolysin," a soluble compound of thiosinamin, containing 47 per cent. of iodine; a diabetic flour; and surgical Pitibulin, double the strength of the obstetrical Pitibulin, for surgical shock. "Antivirus" is a series of specific local immunisers prepared from the broth culture in which bacteria have been grown.—[47] Boots Pure Drug Co., Ltd. (Station-street, Nottingham): a representative display of the firm's special medical products, fine chemicals, medicated capsules, and compressed tablets; gonococcal vaccines made at St. Thomas's Hospital; capsules of hexyl resorcinol, a new intestinal antiseptic, and a full range of the antivenereal preparations "Stabilarsan," "Bismostab," "Thiostab," "Acriflavine," and "Chloramine-T." The "Alpine" sun lamp was demonstrated in the local branch.—[83] C. J. Hewlett and Son, Ltd. (35–42, Charlotte-street, and 83–85, Curtain-road, London, E.C. 3): a number of original preparations, including Mist. Pepsinæ Co. c. Bismutho; Mist. Hepatica Conc.; an antiseptic cream; "Somnigen," a preparation of opium free from disagreeable odour, taste, and after-effects; "Veronigen," a liquid preparation of barbitone; "Hormonigen," a compressed pluriglandular tablet, and Dr. Crofton's human tubercle bacillus solution.—[64] The Hoffmann-La Roche Chemical Works, Ltd. (7, 8, Idol-lane, London, E.C. 3): besides the well-known "Omnopon," "Sedobrol," and "Spasmalgin," "Allonal" a non-narcotic analgesic; chocolate iodostearin tablets used in the prophylaxis and treatment of simple goitre in school-children, and "Digalen" amorphous digitoxin, a chemically standardised and physio-

logically controlled preparation of digitalis, free from inactive and toxic constituents.—[78, 79] Oppenheimer, Son and Co., Ltd. (179, Queen Victoria-street, London, E.C. 4): in addition to the various palatinoids, bipalatinoids and "Roboleine"; an aeriser for reducing all liquids to a fine invisible smoke for the treatment of affections of the respiratory tract; "Balmosa," an analgesic antiseptic cream; and "Pinheroin," containing terpene hydrate and heroin hydrochlor. with essence of Canadian pine.—[11] Parke, Davis and Co. (50, Beak-street, London, W. 1): a series of pharmaceutical preparations, including "Dibromin," a crystalline germicide containing about 56 per cent. of bromine; "Metagen," a concentrated vitamin preparation and "Metagen" combined with cod-liver oil; a 1 per cent. solution of silver nitrate in wax capsules to instil into the eye of the new-born baby; and a selection from the series of vaccines prepared at St. Mary's Hospital.—[51] Burroughs Wellcome and Co., Ltd. (Snow Hill Buildings, London, E.C. 1): amongst additions to the list of "Tabloid" products: "Tabloid" digitalis leaf, presenting the whole substance and activity of selected digitalis leaves; "Tabloid" hexamine and "Tabloid" methylene blue; "Kharsulphan," a new antisyphilitic for hypodermic or intramuscular injection; "Hypoloid" bismuth metal suspended in isotonic glucose solution; a demonstration of the stages in preparation of "Tabloid" thyroid gland and "Wellcome" insulin; "Tabloid" iodicin, gr. 3, for adults and with chocolate base for children; and a series of vaccines and sera.—[67] Burgoyne, Burbidges and Co., Ltd. (East Ham, London, E. 6): a collection of pharmaceutical preparations, including Cooper's colloids; "Chlorobrome" for insomnia and sea-sickness; "Neutramyne" tablets of cod-liver oil, and ethyl chaulmoograte sodium morrhuate for leprosy.—[68] Ferris and Co., Ltd. (Bristol): pharmaceutical specialties, including Elixir parathyroid and calcium lactate; Elixir "Vi-glandin," a preparation of thyroid, pituitary, orchitic and ovarian substance in combination with the glycerophosphates of calcium, iron, sodium, potassium, and magnesium; "Otoids"; "Sterisols," for hypodermic injection; surgical instruments and dressings and scientific apparatus.—[77] Lionel Cooper (14, Henrietta-street, London, W.C. 2): various drugs, including "Milesia," a soluble tablet containing gr. 3 magnesium hydrate, plain or flavoured with peppermint; "Presoiod," an iodine solution prepared from the formula of Prof. Pregl, plain, concentrated or pepsinated; "Salvitæ," a uric acid solvent in granular form; and "Sil-Al," a physiologically pure silicate of aluminium in the form of a white tasteless powder which forms a colloidal suspension when mixed with water.

Special pharmaceutical preparations were shown by [6] J. C. Eno, Ltd. (Victoria Embankment, London, E.C. 4): the well-known effervescent saline laxative.—[8] Crookes' Collosols (The Crookes Laboratories, 22, Chenies-street, London, W.C. 1): the wide range of "Collosol" drugs, among the latest additions being "Collosol Lactalumina," an antacid; "Collosol Ichthyol," a British preparation; "Collosol Kaolin"; also a "Collosol Kataplasma Iodokaolin" for use as a poultice in inflammatory conditions.—[26] W. Dederich, Ltd. (Stanley House, Dean Stanley-street, London, S.W. 1): the original "Ichthyol" sulphonated schist oil preparation; "Pantosept" tablets, which when dissolved in water produce a solution of hypochlorous acid for antiseptic purposes. This firm is also the agent for the preparations of J. D. Riedel, A.G., Berlin, whose "Noctal," a soporific without disagreeable after-effects, deserves mention.—[36] The Semprolin Co., Ltd. (18, Leather-lane, London, E.C. 1): the various combinations of "Semprolin" emulsion of paraffin oil; the plain oil which may be prescribed with anything the practitioner desires; the emulsion with phenolphthalein; with guaiacol carbonate; with salol; and with bismuth and pepsin. Also "Carmex," the mild laxative and corrective for children.—[49] Armour and Co. (Queen's House, Kingsway, London, W.C. 2): a series of endocrine preparations in tablet, capsule, powder, hypodermic, and liquid form. The ovarian and corpus luteum preparations are now standardised as well as the pituitary.—[54] Genatosan, Ltd. (Loughborough, Leicestershire): in addition to their well-known "Sanatogen," "Formamint," "Genasprin," and detoxicated vaccines; "Nasmint," a germicidal snuff; and a particularly pure and stable calf lymph.—[57] A. and M. Zimmermann, Ltd. (3, Lloyd's-avenue, London, E.C. 3): several specialties from the Schering laboratories, including the hypnotic "Medinal"; "Atophan"; "Atophanyl," a solution of the sodium salts of "Atophan" and aspirin with novocaine; "Arcanol," a combination of "Atophan" and aspirin used for influenza; "Veramon," a powerful non-habit-forming analgesic.—[63] Deshell Laboratories, Ltd. (150, Southampton-row, London, W.C. 1): "Petrolagar," a compound of agar-agar with paraffin oil in its four forms: plain, with phenolphthalein, without sugar for diabetic cases, and with alkali for hyperacidity and the constipation of pregnancy.—[72] The Anglo-American Oil Co., Ltd. (Albert-street, London, N.W. 1): the well-known "Nujol" liquid paraffin; and "Mistol," a combination of menthol, camphor, and eucalyptol with paraffin; also "Cream of Nujol with Agar," and a new insecticide spray "Flit."—[80] J. W. Carnrick and Co. (40, Lexington-street, London, W. 1): various pluriglandular formulæ, including the well-known "Hormotone" and "Trypsogen"; also "Erythrogen," a bone-marrow preparation for anæmia; and "Rhythmin," a peristaltic stimulant.—[15] The British Dye-Stuffs Corporation, Ltd. (70, Spring-gardens, Manchester): the drugs S.U.M. 36 and S.U.P. 36; the arseno-benzine preparations for intravenous or intramuscular injection in gonorrhœa and inflammatory conditions.

Among toilet preparations:—[48] "Pepsodent," the pioneer acid dentifrice, and [56] Kolynos Inc. (Chenies-street, London, W.C. 1) demonstrated their dental creams.

FOOD PRODUCTS.

[18] Brooks and Warburton, Ltd. [40–42, Lexington-street, London, W. 1): the various Mead's infant diet materials, including "Dextri-Maltose," for use in all cases where sugar is needed; "Re-Co-Lac," a reconstructed milk powder; and certified Newfoundland cod-liver oil, a biologically tested and standardised preparation.—[23] Thew, Hooker and Gilbey, Ltd. (Buckingham): Hooker's Malted Milk, and "Lacta," an evaporated milk for infant feeding.—[34] Benger's Food, Ltd. (Manchester): the various products of the company, including peptonising powders, peptonised beef, and chicken jellies and lentil flour; illustrated by photographic slides showing the action of an artificial gastric juice on milk and milk mixtures.—[35] Montgomerie and Co., Ltd. (Ibrox, Glasgow), the proprietors of Bermaline bread: two new brands of infant and invalid food, "Berina" food for children up to 6 months, and "Berina" Malted Milk for older patients.—[39] Trufood, Ltd. (Lever House, Blackfriars, E.C. 4): "Trufood Full Cream Milk," a full cream Cheshire dairy milk in powder form; "Secway," whey in powdered form for delicate and premature infants; and "Humanised Trufood," which essentially agrees in its composition with breast milk.—[59] Virol, Ltd. (Hanger-lane, Ealing, London, W. 5): the well-known "Virol," a composition of marrow-fat, glycerine extract of red bone-marrow, malt extract, eggs, lemon syrup and salts of lime and iron; "Virolax," an emulsion of Virol with 60 per cent. liquid paraffin; and "Virol and Milk," a tonic food for invalids, nursing mothers, and athletes.—[61] Cadbury Bros., Ltd. (Bournville): cocoa and chocolate.—[66] Ambrosia, Ltd. (Huntley and Palmer, Ltd., Reading): "Ambrosia Devonshire Milk" for infants and invalids; "Ambrosia Cocoa and Milk," a nutritious food for growing children and nursing mothers.—[70] Glaxo, Ltd. (56, Osna-

burgh-street, London, N.W. 1): in addition to "Glaxo" full cream, three-quarter cream, half cream, and malted food, "Prescription Glaxo," a dried milk powder giving percentages closely approximating to breast milk; "Glax-Ovo," a combination of milk, malt, and cocoa with ostelin; and "Ostelin," a high concentration of the antirachitic unsaponifiable fraction of cod-liver oil, three drops being equivalent to 1 drachm of the original oil.—[81] Oxo, Ltd. (Thames House, Queen-street-place, London, E.C. 4): besides "Oxo," the peptonised and unseasoned hospital "Oxo"; Lemco unseasoned beef extract; the various "Oxoid" endocrine preparations in tablet and food extract forms, of which the latest is "Pitoxylin," a sterile and protein-free solution of the purified oxytocic and pressor substances from the posterior lobe of the pituitary, supplied in a 10 per cent. obstetrical and general extract and a 20 per cent. surgical extract.

MEDICINAL AND MINERAL WATERS AND SPAS.

[20] Ingram and Royle, Ltd. (45, Belvedere-road, London, S.E. 1): the bottled Vichy-Célestins, Contrexeville, and Hunyadi János waters.—[17] Harrogate: This spa is particularly active in scientific work. All the continental methods of treatment are available in addition to several original methods. An entirely new apparatus has been installed in the throat and nose department and many long-standing nasal troubles have yielded to the administration of the waters in an atomised condition. A special bath-room has been equipped with laboratory and clinical apparatus, and is used solely for balneological research. A permanent scientific officer and analyst has been appointed, and the attendants are fully certificated.—[65] Buxton: Attractive booklets, setting out the value of radio-active thermal water at 82° F. and the chalybeate spring. The baths contain swimming pools and immersion baths, in all of which the water is continually running from the springs. The attendants are specially trained and examined by medical men for their certificate.—[60] Droitwich, which is developing its technical work and considering the establishment of an electro-medical section. The brine content of the waters is considerably higher than that of any other European mineral springs. The social amenities are very complete, and include tennis and croquet lawns and a golf course, photographs of which were on view.—[42] Gaymer's Cider (Attleborough, Norfolk) were demonstrating for their twenty-eighth consecutive year an assortment of their various brands, of which their dry ciders have gained widespread medical approval.—[19] Alexander Riddle and Co., Ltd. (Bancroft-road, London): Stoewer's lime-juice and lemon-juice preparations, made from selected fruit and refined sugar, without artificial colouring, essence or acid, containing vitamin C.

MICROSCOPES AND SCIENTIFIC APPARATUS.

[3] The Tintometer, Limited (The Colour Laboratories, Salisbury): a variety of pathological apparatus, particularly the "Red Cell Suspensionometer" of Dr. H. St. Amand Agate for the Wassermann test; and an improved form of Oliver's hæmoglobinometer.—[15] The British Dye-Stuffs Corporation, Ltd. (Manchester): a range of indicators for pH values; microscopic stains, specially tested pathologically and chemically; and chemical reagents.—[24] O. Sichel and Co., Ltd. (52, Bunhill-row, London, E.C. 1): the "Kinograph," an apparatus suitable for photographing living subjects and pathological specimens—it will do every photographic process, including enlarging and reducing from X ray negatives, and the very high-powered and steady illumination employed gives perfect control over exposures; also the "Eco-Dry" cabinet, heated by electricity, for the rapid drying of X ray and other negatives.—[28] British Drug Houses, Ltd. (16–30, Graham-street, London, N. 1): the "B.D.H. Capillator," a series of sealed capillary tubes filled with buffer solutions containing indicator, which give very accurate pH indications with the use of a minimum of fluid; the "B.D.H. Comparator" case for storing sealed buffer tubes; the "B.D.H. Universal Indicator," showing the whole range of spectrum colours over a wide pH range; and the "B.D.H." histologically standardised microscopic stains.—[32] Messrs. Chas. Hearson and Co., Ltd. (68, Willow-walk, London, S.E. 1): several models of the well-known Reichert microscopes, for which they are sole agents; a spectroscopic eye-piece by Reichert; the dark ground illuminator of Prof. Arzt; a high-speed centrifuge giving 3000–10,000 revolutions per minute, suitable for the separation of ultra-microscopic viruses; and "Cornic's Half-Shadow Saccharimeter" for estimating grape-sugar and albumin in urine.—[53] Short and Mason, Ltd. (Atlantic House, 45–50, Holborn Viaduct, London, E.C. 1): the "Tycos" sphygmomanometers, portable and surgery types; also clinical and recording thermometers; and the "Micro-Barograph," a very sensitive recording barometer.—[76] Baird and Tatlock, Ltd. (14–15, Cross-street, Hatton-garden, London, E.C. 1): a series of autoclaves, centrifuges and other bacteriological apparatus; fittings of all kinds for hospital and public health laboratories; and apparatus for blood-sugar estimation.—[14] Eastman (Kingsway, London, W.C. 1): a series of "Dupli-Tized" X ray film negatives, with reductions and enlargements, showing the legibility and uniformity of the image; apparatus for simplified methods of development.

MEDICAL AGENCIES.

[9] The Medical Insurance Agency (429, Strand, London, W.C. 2), in addition to their usual literature, had a typical doctor's car for demonstration, supplied by Mann, Egerton and Co., and a qualified engineer to advise on car questions.—[73] The Medical Sickness, Annuity and Life Assurance Society, Ltd. (300, High Holborn, W.C. 1): demonstrations of various policies, including their "Every Contingency" Sickness, Accident and Endowment Policy; and the "Perfect" Educational Assurance policy.—[38] Arnold and Sons (50–52, Wigmore-street, London, W. 1): a medical transfer department for practices and locum-tenents.

BOOKS.

[1] Stanley Phillips (45, Brondesbury-road, London, N.W. 6): a collection of the latest publications of Messrs. F. A. Davis Co., Philadelphia; E. and S. Livingstone, Edinburgh; and Cassell's, London, including Hay's Diseases of the Ear, Nose and Throat; Sajous' Analytical Cyclopædia of Practical Medicine; Russell's "Ultra-Violet Radiation," and McKendrick and Whittaker's "X Ray Atlas"; and the "Practical Medicine Series of Year Books."—[21] H. K. Lewis and Co., Ltd. (136–140, Gower-street, London, W.C. 1): a selection of their publications, including L. R. Fifield's "Minor Surgery"; E. A. Barton's "Essentials of Infant Feeding"; B. Burnett Ham's "Synoptic Chart of Skin Diseases," and the second edition of W. Ironside Bruce's "System of Radiography"; the *Clinical Journal*; and a selection of card index systems, ledgers, case sheets, &c.—[58] Constable and Co., Ltd. (10–12, Orange-street, London, W.C. 2): a selection of publications, including a "Modern Methods" series; and "Towards Moral Bankruptcy," by Bureau.—[71] W. B. Saunders Co., Ltd. (9, Henrietta-street, London, W.C. 2): a number of standard works in all branches of medicine.—[75] John Wright and Sons, Ltd. (Bristol): the "Medical Annual"; the *Journal of Surgery*; new editions of many well-known handbooks; and various systems of bookkeeping.—[82] J. and A. Churchill (7, Great Marlborough-street, London, W. 1), celebrating their centenary this year, showed a number of new and standard works, including Beaumont and Dodds's "Recent Advances in Medicine"; Goulden's "Refraction of the Eye"; Jackson's "The Effects of Inanition and Malnutrition upon Growth and Structure"; and Koby's "Slit Lamp Microscopy of the Living Eye."—[85] The Oxford University Press (Amen House, Warwick-

square, London, E.C. 4): text-books on medical, surgical and allied subjects, including Price's "Medicine"; Leonard Williams's "Middle Age and Old Age"; Cope's "Clinical Researches in Acute Abdominal Disease"; and Taylor's "Neurological Fragments," by J. Hughlings Jackson.—[10] The Food Education Society (24, Tufton-street, London, S.W. 1) showed a series of pamphlets and books on food, cookery, and hygiene, including "The Gateway to Health"; "Rearing an Imperial Race"; "Facts for Patriots"; and "Puddings and Porridge."

New Inventions.

A NEW FILTER-PAPER PULP-HOLDER.

FOR several years one of us has used filter-paper pulp in an improvised holder for the purpose of filtering culture media and other fluids with invariable success. The chief feature of this pulp-holder is that as much as possible of the under surface of the pulp should be free for the passage of the filtered

material. We have now devised the holder here illustrated designed to simplify the preparation of the filter.

1. For a filter of 6 in. diameter 4 oz. of dry filter-paper pulp is broken up in about two litres of water. It is then reduced to a state of very fine division by the hands or with a whisk. 2. Pour the prepared pulp into the filter-holder and allow the superfluous water to drain away. 3. Connect to the exhaust pump and filter bottle. Exhaust gently, in the meanwhile pressing the pulp down firmly and evenly with the rammer (F) until no more water is drawn through. 4. Cover the pulp (D) with about 1 in. of washed sand (C). 5. Place the float (A) on the sand. The float is of service because fluids poured on to it do not disturb the surface of the sand. 6. Draw through about a pint of water (hot water if jellies are to be filtered) to clear away any fragments of pulp which may have escaped through the gauge (E). When the water reaches the surface of the sand, clamp the tube connecting the filter with the exhaust pump. 7. Disconnect the filter bottle or flask, empty the bottle, and reconnect it to the filter. The filter is now ready for use. The procedure should not take longer than 10 to 15 minutes.

Procedure for Filtering.—1. Pour the fluid to be filtered on the float until the filter is full. If a jelly is to be filtered replace the remainder in the steamer until there is room in the filter. 2. Connect exhaust bottle by unscrewing clamp and exhaust gently. The water which was held in the pulp will come through first. By observing the glass connexion the filtrate can easily be seen to follow the water which was held in the pulp. At this point clamp off, empty filter bottle, reconnect, and exhaust again gently.

With a properly made filter, 5 to 6 litres of agar can be filtered in half an hour without the addition of egg albumin. By preparing the filter with two layers of pulp and sand alternately bacterially contaminated fluids or broth cultures can be freed of at least 90 per cent. of bacteria. When such fluids have to be passed through a germ-proof filter, a preliminary passage through a pulp filter represents a great saving of time and of filter candles.

Messrs. Baird and Tatlock have made the pulp-holder for us.

E. T. THOMPSON.
E. CHARD.

Orpington.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt.-Comdr. J. S. McGrath and Surg. Lt. H. C. C. Veitch are placed on Retd. List.

ROYAL NAVAL VOLUNTEER RESERVE.

The King has approved of the award of the Royal Naval Volunteer Reserve Officers' Decoration to Lt.-Comdr. E. Elgood.

Proby. Surg. Sub-Lt. H. O'Connor to be Surg. Sub-Lt.

ROYAL ARMY MEDICAL CORPS.

Maj. G. O. Chambers retires, receiving a gratuity, and is granted the rank of Lt.-Col.

The undermentioned Majs. retire on ret. pay:—E. L. Moss and E. G. Anthonisz, and are granted the rank of Lt.-Col; M. Keane and G. H. Rees.

The undermentioned from Reg. Army Res. of Off. to be temp. Capts.: Lt.-Col. W. Owen-Prichard (and relinquishes the rank of Lt.-Col.), and Capt. S. Pinion (and relinquishes the rank of Capt.).

RESERVE OF OFFICERS.

Capt. A. G. Henderson, late temp. Capt., R.A.M.C., to be Lt.

MILITIA.

Capt. T. W. E. Elliott to be Maj.

TERRITORIAL ARMY.

C. E. Fenton to be Lt.

Capts. A. F. L. Shields (late R.A.M.C. Militia), H. F. W. Adams (late R.A.M.C.) and J. P. J. Jenkins (late R.A.M.C., Special Reserve) to be Capts.

2nd Lt. T. A. S. Samuel (late 15th Lond. R.) to be Lt.

ROYAL AIR FORCE.

Flight Lt. A. E. Henton relinquishes his temporary commission on ceasing to be employed and is permitted to retain his rank.

The undermentioned Capts., Army Dental Corps, are granted temporary commissions as Flight Lts. on attachment for four years' duty with the R.A.F.: M. J. O'Reilly, S. A. McCormack, and P. P. Hogan.

The undermentioned Flight Lts. (Capts., Army Dental Corps) relinquish their temporary commissions on return to Army duty: G. F. Charles, L. Somerville-Woodiwis, and J. H. W. Fitzgerald.

THE LANCET.

LONDON: SATURDAY, AUGUST 8, 1925.

NEW LIGHT ON MUSCLE TONE.

A NOTEWORTHY feature of the study of diseases of the nervous system in recent years has been a return to more purely clinical and physiological methods of approach. This tendency is well seen in Dr. KINNIER WILSON'S Croonian lectures on Some Disorders of Motility and Muscle Tone with Special Reference to the Corpus Striatum, of which the final instalment now appears in our columns. The Croonian lecturer is to be warmly congratulated on his survey of an admittedly intricate neurological problem; the space demanded for its elaboration was warranted by its practically helpful nature. It is no exaggeration to say that 20 years ago our knowledge of the functions and diseases of the corpus striatum was almost negligible, while our conceptions of disorders of motility in general and of muscle tone in particular were strictly limited. Since then an enormous amount of investigation, both clinical and pathological, has taken place, amongst which the original work of Dr. WILSON himself in identifying the syndrome now known as progressive lenticular degeneration (Wilson's disease) with disease of the corpus striatum must always hold a high place of merit. No one indeed is more fitted than he to throw light on the darkness of the general knowledge of this subject. But speculation and hypothesis have much exceeded ascertained facts in this as in other departments of medicine, and the student may well be disconcerted at the confusing nomenclature and theories which have been adumbrated. The various types and the sequelæ of epidemic encephalitis have, as is well known, added largely to the group of conditions in which disorders of motility and of muscle tone are commonly seen and attributed to striatal disease. The frequency in particular of the Parkinsonian syndrome as a sequel of this disease has provided opportunities of study of which Dr. WILSON has availed himself very fully.

Dr. WILSON'S careful analysis of the symptoms of striatal disease as exemplified in the Parkinsonian syndrome may be compared with Prof. CRUCHET'S University of London lecture, published in this issue, on the Relation of Paralysis Agitans to the Parkinsonian Syndrome of Epidemic Encephalitis. In many respects their opinions differ, as will presently be shown. The "paralysis," to use a general term, present in the Parkinsonian syndrome is considered to comprise three factors: (1) A relative motor weakness, most marked in those muscles whose mass is small; (2) a slowness of movement; and (3) a poverty of movements. The term "akinesis" is used to embrace these three symptoms, and the suggestion is made that part at least of this akinesis arises from an unwillingness to move, since in this disease movements require an unusual effort. One of the symptoms generally described as occurring in the Parkinsonian state is a loss or diminution of the so-called "associated" or "automatic" movements. Such movements Dr. WILSON prefers to call movements of coöperation, and he is at pains to show first that these sorts of movements are not in reality lost, and, secondly, that to argue from their supposed absence the existence of a centre for such movements in the corpus striatum is a fundamental mistake. With his opinion on this point we are in entire agreement. The general opinion that there is an increase in muscle tone in these disorders is upheld by the lecturer, though the relation between the increase in tone and the loss of movements is not constant. We cannot here follow the lecturer in all his arguments, but the reader will note with interest that Dr. WILSON disagrees profoundly with HUNTER'S recent conclusions as to the existence of a condition of plastic tone in the Parkinsonian state. Involuntary movements of different kinds are usually held to hold a place in the symptomatology of diseases of the corpus striatum. The principle laid down by HUGHLINGS JACKSON is recalled that positive symptoms, such as involuntary movements or tremor, cannot be directly caused by a purely destructive lesion. Such symptoms may be due to irritation or they may constitute what is now known as a "release phenomenon"—that is, the incoördinated or unqualified action of certain neural mechanisms when released from the normal control of the mechanisms which have been destroyed. The problem, therefore, is, as Dr. WILSON suggests, not what mechanisms are paralysed but what are active. Regarding the involuntary movements of chorea, Dr. WILSON has made the interesting observation that in many cases he found an interruption of the normal reciprocal innervation of muscles. He considers that a relative integrity of the pyramidal or cortico-spinal tracts is essential for the appearance of true choreiform movements, an opinion which receives strong support from the established clinical fact that the greater the amount of paralysis in chorea ("limp chorea") the less is the amount of movement present. No sharp distinction can be drawn between the movements of chorea and those of athetosis, and it is natural to postulate a similar cause for the two conditions. Dr. WILSON'S arguments lead to the view that both chorea and athetosis have their origin in some afferent disorder of regulation, attributable to lesions of the cerebello-mesencephalo-thalamo-cortical path, from which conclusion the conception of an involuntary cortical motor activity follows.

The pathogenesis of tremor has long been a matter of dispute. Few probably will gainsay the view that it must be regarded as a release phenomenon of some kind. In Dr. WILSON'S view it differs fundamentally from chorea and athetosis, if only because in tremor the normal reciprocal innervation of muscles is still found, while in chorea and athetosis it is wanting. His conclusions are so interesting that they may be here repeated. "Tremor is an involuntary movement belonging to the old motor system (infra-cortical subpallial), while choreo-athetosis is an involuntary movement of the new (cortical pallial) system." Prof. CRUCHET'S close clinical studies of the features of the post-encephalitic Parkinsonian state and of paralysis agitans have led him to the conclusion that the two conditions are entirely different, a view which we think few neurologists in this country will support. His description of what he calls the bradykinetic syndrome approximates very closely to the akinesis of Dr. WILSON. But where he differs profoundly from most authorities is in his denial of the existence of any true rigidity or muscular hypertonus in the Parkinsonian state, an opinion in which we confess ourselves unable to follow him, though with many of his differential points in diagnosis between paralysis agitans and the post-encephalitic Parkinsonian state we are in full agreement. We feel

that these Croonian lectures should be of service in disentangling essentials from a mass of confusing hypotheses, which have been erected on an unstable base of unconvincing attempts in the correlation of clinical symptoms with the facts of morbid anatomy. In the unravelling of the problems of disease of the human nervous system the clinical method must always hold the first place and the value of these lectures as an example of close and unbiased clinical studies is great. They should serve to quicken interest in a difficult subject and rouse the possibly flagging spirits of any who may have been led to think that the day was past when purely clinical methods could achieve progress.

FOOD SOPHISTICATION IN 1924.[1]

THE sophistication of food is a tempting form of deceit, and the last report of the Ministry of Health shows that it has not lost its attraction for various trades. When the purveyor causes 2 lb. of sugar to appear where only 1 lb. grew before he is expressing his impulse to cultivate; in selling them by misrepresentation he is educating his wits; financially he is satisfying his acquisitive instincts. But these considerations do not appeal to a public which expects a pure food-supply. Wherever and whenever found such offenders should be treated in accord with their demerits, and it is matter for satisfaction that in this country to-day their careers are becoming precarious. Under the administration of the Sale of Food and Drugs Act there has been an increased activity on the part of many local authorities during 1924. The total number of samples analysed was 118,000—an increase of 3154 over the previous year—and, either as a result of rising interest in the subject or because of an improving moral atmosphere, the percentage of adulterations showed a slight reduction. A total of 6987 samples, or 5·9 per cent., was reported as adulterated or not up to standard, and, although this figure is very large, it compares favourably with the records of 1923 (6·1 per cent.) and 1922 (6·2 per cent.).

Milk was as usual the chief object of analysis, and of 62,133 samples which were purchased and submitted for analysis 7·7 per cent. were regarded as adulterated or not up to standard. This did not represent any improvement on the figure for 1922 and virtually none on that for 1923; but there were only 160 samples described as contaminated with dirt, as against 197 in 1923, which suggests that the efforts of the Ministry of Agriculture and other cognate bodies towards securing a clean milk-supply are proving effective. In 25 cases successful legal proceedings were instituted against vendors of dirty milk, and the cynical may note with relish that on Sundays there is more tampering with milk owing to the greater demand and a feeling of greater immunity from interference. Samples procured on Sundays in the county of Durham showed adulteration in 27·6 per cent. of cases, although the figure for all the specimens collected throughout the year was only 15·5 per cent. The addition of colouring matter is infrequent. Altogether 68 samples were reported against on account of such additions, and in 33 cases fines or costs were recovered; but in spite of the considerable number of prosecutions against milk-sellers, only two were prohibited from further carrying on their trade. As the fines inflicted were usually not large, it would seem that in all punitive proceedings reliance has been chiefly placed on the publicity which is given to the guilt. Over 10,500 samples of butter were analysed during the year, but of these only 1·4 per cent. were condemned as not up to the requirements of the Act. Loading with water is the most common treatment, and 74 samples contained water in excess of the maximum of 16 per cent. legally permitted. Foreign fats, such as margarine, were found in 68 samples, and in nine there was more than 0·5 per cent. of boric acid. At Leeds an informal sample of butter was purchased by the police from a hawker in the street. It was submitted to the public analyst, who reported that it was wholly margarine, and the vendor was sent to prison for three months for obtaining money under false pretences. Special interest has been taken in condensed and dried milks on account of the recent regulations dealing with them. A larger number of samples than usual was taken; but it was found that the percentage reported against remained about the same. Some were deficient in fat; three were contaminated with lead, and a good many were sold in tins bearing labels not in accordance with the law; but as the majority of the cases were first offences the local authorities generally contented themselves with cautioning the vendors. The sale of boricised cream without proper notice to the purchasers is still remarkably common. Altogether 196 out of 1089 samples bought as fresh cream contained boric acid, and 24 out of 1016 samples bought as preserved cream contained boric acid in excess of the maximum of 0·4 per cent. allowed. It may be observed in this connexion that the Committee appointed in 1923 by the Minister of Health to consider the uses of preservatives has advised the total prohibition of boron derivatives in food. Their cumulative action is obscure, but appears to be harmful, and from the practical aspect the Committee was convinced that they could be dispensed with in food without serious inconvenience to traders or consumers.

From the reports it would appear that the more unregenerate days of the "wicked grocer" are passing. A sugar adulteration of 0·3 per cent. of cases in 1924 is, comparatively speaking, negligible. The grocer is gaining a vindication from Mr. CHESTERTON'S assertion that

> "He sells us sands of Araby
> As sugar for cash down."

Full-blooded poets are apt to belittle the grocer, and cry up mine host at the inn, so that the grocer may smile at the discovery that the righteous minds of innkeepers have led them in 13·5 per cent. of cases to adulterate their spirits. Two defendants charged with selling diluted spirits based their defence on notices exhibited in their bars advertising that the alcoholic strength of their wares was not guaranteed; but the ruling went against them on the ground that the article supplied was not of the nature, substance, and quality demanded. The display of notices in bars appears to be relatively inefficient. Not all grocers, however, have abandoned subtlety, and there has been some doubt in various places whether dyed and flavoured maize can legitimately be labelled as custard powder. Furthermore, several jam manufacturers have been prosecuted: one of them was fined £20 and ordered to destroy 1400 lb. of his produce, and another, whose strawberry jam contained not less than 75 per cent. of apple jelly but not one whole strawberry, had to pay a similar fine and costs. It is obvious from this information that the present machinery for detecting and displaying fraud is of great importance. Though it

[1] Sixth Annual Report of the Ministry of Health (1924–1925); Annual Report of the Chief Medical Officer of the Ministry (1924). H.M. Stationery Office. 1925. Each volume 3s. 6d.

would be unwise to argue that the reduction of adulterated samples in two years from 6·2 per cent. to 5·9 per cent. indicates that in 40 years dishonesty will have been abolished in this country for ever, it may nevertheless be admitted that the outlook for the future is encouraging. In the meantime the machinery requires local support and extension.

INTERNATIONAL CONGRESS OF THE HISTORY OF MEDICINE.

THE Fifth International Congress of the History of Medicine was held at Geneva from July 20th to the 24th under the presidency of Dr. Charles Greene Cumston, lecturer in the history of medicine at the University of Geneva, with Sir D'Arcy Power as president of honour. The meetings, which were held in the Athénée, were well attended, representatives being present from Belgium, Cuba, Denmark, France, Great Britain, Holland, Italy, Morocco, Poland, Spain, Switzerland, and the United States. Opening addresses were delivered by the President of the Congress, the President of the Medical Society of Geneva, the representative of the Council of State, the rector of the University of Geneva, and the President of the International Society of the History of Medicine, and were followed by a lecture by Prof. Eugène Pittard, illustrated by lantern slides, on operations in the Stone Age. Special mention should be made of Dr. Cumston's address, which contained an account of the distinguished Geneva physicians Daniel Le Clerc, whom Dr. Cumston described as the father of the history of medicine, Jean Antoine Sarasin, the writer on plague, and Théophile Bouet, the morbid anatomist. In the evening the members of the Congress were entertained by the President and Mme. Cumston at the Hôtel des Bergues, where a concert terminated with the delivery of an ode specially prepared for the occasion in honour of the medical profession. On July 21st the principal papers read were one by Sir D'Arcy Power on the Disputationes chirurgicæ selectæ, or early eighteenth century theses, edited by Albrecht von Halle, and one by Dr. J. D. Rolleston on Voltaire and English doctors, particularly Cheselden, Mead, Hans Sloane, Friend, and Towne, the author of a work on diseases in the West Indies and translator of part of La Henriade. Dr. John Comrie lectured on the eighteenth century neurologist, Robert Whytt, who gave the first clear description of tuberculous meningitis; Dr. Guisan, of Lausanne, on Fabricius Hildanus, the celebrated surgeon of Basle; Dr. J. G. de Lint on a letter of Tronchin dealing with the Suttonian method of inoculation; Dr. Ernest Wickersheimer on the presence of syphilis at Geneva at the end of the fifteenth century; and Mr. C. J. S. Thompson on hygiene in early civilisations. In the afternoon a garden party was held in the grounds of Dr. and Mme. Rilliet's house at Vengeron, where, in addition to an admirable view of the lake and of Mont Blanc, the members of the Congress had an opportunity of inspecting the library of Dr. Frédéric Rilliet, the author of the well-known work written in collaboration with Barkez on diseases of children, and of meeting the veteran pædiatrist, Prof. D'Espine, whose resemblance to the late Sir Clifford Allbutt struck several of the British members present. On July 22nd papers were read by Dr. R. O. Moon on Paracelsus and medicine, by Dr. E. B. Krumbhaar, of Philadelphia, on the medical literature of the seventeenth century as exemplified in the Elzevir Press, by Dr. H. Renaud, of Rabat, on some recent acquisitions to the history of Arabian medicine in Morocco, by Dr. Tricot Royen on the history of lepers at Antwerp and Louvain, by Dr. Wickersheimer on the surgeon Jean Gispaden, who flourished at Grenoble and Annecy at the end of the fifteenth century, and by Mrs. Lilian Lindsay on the growth of dentistry in England from the earliest times to the beginning of the nineteenth century. The afternoon meeting was followed by a visit to the Rousseau Museum and the University library, where a number of rare works were on view. In the evening the Congress was received by the administrative Council of the city of Geneva at the Palais Eynard.

On the following day the Congress made a tour on the lake and visited the Castle of Chillon, when the medical profession of Montreux provided lunch, and then to Evian-les-Bains, where a banquet was offered by the administration of the spa. On the 24th Dr. Wierzbicki read a paper by himself and Prof. A. Wrzosek on auscultation in Poland during the first half of the nineteenth century. Dr. J. W. Courtney, of Boston, dealt with Dr. Benjamin Waterhouse, "the Jenner of America." Dr. De Alcarde of Madrid, exhibited the iron crown used in the middle ages as a cure for certain diseases of the head, and Dr. Bugiel described the life of the Polish students at the Paris Faculty of Medicine in the thirteenth, fourteenth, and fifteenth centuries. Mr. C. J. S. Thompson, in the absence of the writer, read Dr. J. B. Hurry's paper on I-Em-Hetep, prime minister to King Zoser, and afterwards the medical god of Egypt. The secretary of the Congress, Dr. de Peyer, contributed a communication on his ancestor Jean Conrad Peyer, the anatomist and physician of Schaffhausen. The Congress terminated in the evening with a banquet at the Hôtel des Bergues.

The next Congress will be held at Leyden in the last week of July, 1927, under the presidency of Dr. J. G. de Lint.

Annotations.

"Ne quid nimis."

COMFORTABLE WARMTH FOR MENTAL WORKERS.

RESEARCHES [1] carried out by Margaret Fishenden, D.Sc., and R. E. Willgress, B.Sc., on the heating of rooms for sedentary workers indicate that the most comfortable conditions for mental work correspond with an air temperature of about 55° F. in conjunction with the requisite intensity of radiation for warmth; that is, a source of radiant heat with a horizontal component of radiation equivalent to 75 British thermal units per square foot per hour, over the position occupied by the worker. In their work these authors used a room of about 4000 cubic feet capacity, and compared three sources of radiant heat: (1) gas fire, (2) electric heater, (3) low-temperature (up to 750° F.) specially designed heater (6 ft. square), consisting of a shallow sheet-iron box with asbestos back and baffled interior almost filling the hearth opening and heated internally by a series of Bunsen flames playing upon an arrangement of refractory material. They preferred this low-temperature heater because it gave a more uniform distribution of radiation with height, the degree of comfort being greater than with either of the other two radiators. They found that with slightly higher air temperatures than 55° F. —e.g., 58° or 59° F.—a feeling of mental lassitude was produced, although radiation was still required to maintain warmth without physical exertion. Below 51° or 52° F. draughts or the effects of low air temperature became very perceptible, and the typical "scorched on one side, chilly on the other" sensations associated with open-fire heating in cold weather could be felt.

It is the relatively equable climate in Great Britain which renders open-fire heating practicable. Where

[1] Department of Scientific and Industrial Research. Fuel Research Board, Technical Paper No. 12. The Heating of Rooms: A Comparison of the Costs of Different Methods on the Basis of Warmth Comfort. By Margaret Fishenden, D.Sc., F.Inst.P., assisted by R. E. Willgress, B.Sc., A.R.C.Sc. H.M. Stationery Office. Pp. 48. 1s.

long cold winters are experienced—e.g., the Continent, America, and Canada—open fires have to be abandoned as they do not supply sufficient air heating when the outside temperature is below 45° F., so that closed stoves or central heating are more generally used under these conditions. The authors deal also with air-heating systems, the air being heated either by hot-water radiators, or by ordinary luminous-flame bat's-wing gas burners arranged at suitable intervals around the room at a level of about six inches above the floor. Under such air-heated conditions without any source of radiant heat, an air temperature of about 65° F. is required to produce comfort; this means that the surrounding surfaces must also be at 65° F. and the air velocity very low (about ¼–½ ft. per second even near the floor). It is considered that with a surrounding temperature of 65° F. and ordinary clothing, the human body at rest is able to get rid of the heat produced therein by convection, radiation, and minimal evaporation. Comfort is thus maintained, but these conditions are not so favourable for mental work as when the air temperature is 55° F. and the extra heat supplied by a source of radiant energy. Of course, the air changes by draught up the flue are great with radiant heaters in the hearth, so that there is considerable movement of air in the room. Dr. Leonard Hill has long advocated the avoidance of stagnant air in rooms chiefly because of infection and monotony. He has pointed out in many of his researches that for health and mental alertness, ventilation by open fire and open window is the best in small rooms in this country. The present research confirms this view.

Dr. Fishenden and her co-worker studied also the effects of draughts produced by electric fans. With air velocities of 2, 4, 6, and 8 ft. per second respectively, over the position of the observer dry-bulb air temperatures of 69° F., 72° F., 75° F., and 76½° F. were necessary to sustain warmth, in the absence of radiant heat. They found, however, that with draughts exceeding about 4 ft. per second the movement of air was annoying and detracted the attention from mental work. Of much practical value are the findings of these authors with regard to cost of heating. They calculate from their experiments the cost of different methods for imaginary rooms of 1000, 2000, and 4000 cubic feet respectively, and with occupants up to six in number. For continuous heating in small rooms, hot-water radiators fed from a coke-fired boiler are the most economical; but as the size of the room increases open coke or coal fires become cheaper, especially when there are only a few people in the room. This is because when air heating is employed the whole room must be warmed, however few the occupants, whilst with heating by radiation people can gather around a small fire whatever the size of the room. For intermittent heating, say, when a room is used only for four hours a day, hot-water radiators remain the cheapest for small rooms with more than one or two occupants, but for larger rooms, especially when sparsely occupied, open coal or coke or gas fires become cheapest. For longer periods of use the advantage of open fires over air heating is less pronounced; for shorter periods it is more pronounced. In larger rooms where people cannot gather round the fire, hot-water radiators are usually the cheapest method of heating.

From the health point of view, air heating with stagnation of air in the room is not desirable; and in practice it is often found that conditions of ventilation which appear to favour economy are by no means the healthiest. Thus the poor huddle together with much overcrowding, especially in winter. In China the natives cook their food by means of a fire under a brick platform and use the platform thus warmed as a sleeping couch at night. For many the cost of heating will remain a matter of greater consideration than the acme of hygiene. With the ever-increasing cost of fuel in this country these investigations of the Fuel Research Board have an immediate practical application.

THE DICK TEST.

THE admirable work of Dr. George F. Dick and Dr. Gladys H. Dick on scarlet fever has been followed in this country with keen interest. In January, 1924, they described their skin test for susceptibility to that disease, and in the following month a method of active immunisation. These successes were the result of a number of years of painstaking work and the experimental production of scarlet fever in the human being. In a recent paper[1] they resume this work, and cite further evidence of the production of immunity to scarlet fever. Accurate standardisation of the scarlet fever toxin is essential, and the Dicks state that on testing samples of skin-test solutions from various sources they have found them ranging from one-fourth to four times their proper strength. They believe that a positive reaction may be produced in immune persons by injecting a larger test dose, and that negative reactions may be obtained in susceptible persons by reducing the dose; further, that some skins react with papule formation to intradermal injection of mere sterile salt solution. In order to avoid confusion from this, and from the small reddened area which may be caused by the added preservative, the skin-test dose was so graded that an area of reddening of less than 1 cm. in all diameters is regarded as a negative reaction. On the other hand, an area of reddening, however faint in colour, measuring 1 cm. or more in any diameter, is considered a positive reaction. If the reaction has entirely faded at the end of 24 hours they regard it as negative.

In this country a number of observers have been engaged in testing the Dick susceptibility reaction with results in the main conforming to those obtained in America. Little, however, has been done in attempting to produce active immunity to the disease. The technique for the Dick test is the same as for the Schick test, but it is worthy of note that when the fluid is injected a little more deeply into the skin than it should be, the Dick test is liable to fail where the Schick reaction would appear. Several dilutions of the toxin have been used for experimental purposes, the amount of fluid injected into the skin being kept constant at 0·2 c.cm. The reaction has been found to vary in intensity, in the size of the erythematous area, in its time of appearance, and in the time it lasts. With a dilution of the toxin of 1 in 1000 the Dick reaction appears as an erythematous area (seldom indurated) arising at the site of injection, the erythema varying in intensity in a way comparable to the various tints seen in the different rashes of scarlet fever. The size of the erythematous area varies considerably, but usually measures from about three-quarters of an inch to rather over an inch in diameter. In the experience of Dr. F. Thomson at the North-Eastern Hospital the interval from the time of injection to the commencement of the erythema has averaged from five to six hours, but it may be postponed for 24 hours, and has been observed within two hours. The average duration of the erythema has been about 40 hours, and in two instances only was it under 24 hours. One of these had disappeared in 13 hours when rubbing re-elicited the erythema, which then lasted a further two days. With higher dilutions of the toxin—e.g., 1 in 6000, when injected alongside the 1 in 1000 dilution on the same person—the resulting reactions have been found not infrequently to be as large as with the dilution of 1 in 1000, but their duration was less—seldom lasting 24 hours.

Evidently more work remains to be done before the value of the Dick test can be assessed, but a certain amount of optimism seems to be justified. The occasional failure of the test, when failure is not to be expected, serves at times to create disappointment, but the difficulty in standardising the toxin and the possibility of faulty technique in carrying out the test must be remembered. In the

[1] Journal of the American Medical Association, May 16th, 1925.

meantime it might be well to avoid defining too closely what or what is not a positive result, and to keep exact records of the reactions. The question to which we should like an answer is: Does a positive Dick reaction show that an individual is susceptible to scarlet fever and does a negative result show that he is not? And the answer is not yet forthcoming.

SUBSTITUTED UREAS IN TRYPANOSOMIASIS.

THE undoubted value of the substance known as "Bayer 205," and the obscurity which has hitherto shrouded its constitution, have resulted in focusing attention on its chemical constitution. Since 1923 work of investigation has been carried out in the laboratories of the British Dyestuffs Corporation on the synthesis of certain ureas and their effect upon trypanosomes. The idea of working upon these ureas was suggested by the numerous German patents which had been taken out relating to such bodies, and by a formula, suggested by King in 1921, in which he indicated that the urea was built up by joining two chains which each contained two *p*-amido benzoyl residues. In a paper [1] published in the *Journal of Pathology and Bacteriology* T. H. Fairbrother and others have described in detail the preparation of three ureas and the investigation of their effect on trypanosomes. The trypanocidal action of these substances has been examined by ascertaining the action upon mice infected with *Trypanosoma equiperdum*. This organism is similar to the one which Wenyon employed in estimating the effect of "Bayer 205" in 1921. As a result of their work these investigators were able to show that there is definite evidence of trypanocidal properties in the substituted ureas, which are entirely dependent on the configuration of the molecule and on the groups which go to form it; but the only one of the three synthesised ureas which showed marked trypanocidal properties was the one built up on the formula of Fourneau. This substance is the urea from meta-aminobenzoyl para-methyl meta-aminobenzoyl amino-naphthalene tri-sulphonate 4 : 6 : 8. Whilst the trypanocidal action of this urea in vivo requires further investigation, it has been found that on injection into a mouse its tolerated dose is 10 mg. per 20 g. mouse. The curative dose is as low as 0·05 mg., and this makes the ratio of curative to tolerated dose of 200 : 1.

EXPERIMENTAL PNEUMONIA.

PNEUMOCOCCUS pneumonia remains one of the serious infective diseases, and it is singular as being the only bacterial infection in which a knowledge of the causative agent has not resulted in any perceptible reduction in mortality. The isolation of the several types of organisms has done something; the discovery that the form of coccus which so many normal people harbour in their throats is not usually the form which causes fatal pneumonia has partly, but by no means wholly, explained one of the mysteries of the disease; serum therapy has saved some lives, but it has not come into that wide use which guarantees the substantial utility of a remedy. Progress has been disappointing and the state of affairs at present is highly unsatisfactory. Any further knowledge of the relationship of the organism to the lung is therefore welcome, and those who are interested in the subject will find in the current number of the *Journal of Pathology and Bacteriology* (1925, xxviii., 427) an illuminating paper by Dr. J. F. Gaskell, of Cambridge, on the results of infecting rabbits by insufflation. He worked with a single strain of pneumococcus, the virulence of which varied spontaneously or was deliberately altered during the course of his observations, and his main point is that the effect varies with the virulence and not with the dose. With cultures of low virulence broncho-pneumonic lesions are produced, generally near the root of the lung and strictly localised to the areas originally infected; the animal recovers. With higher virulence localisation is less effective, and by coalescence a lobular pneumonia arises which may extend to pleurisy; with a further increase the whole lobe is involved, giving a true lobar consolidation, often with pleurisy and pericarditis. Finally, with very virulent organisms, an intense fatal septicæmia is obtained with a characteristic miliary lesion throughout both lungs—the lesion, that is, which is produced by subcutaneous inoculation. It will be seen that these results are in accord with the views previously published by Dr. Gaskell and Dr. R. R. Armstrong that the differences between broncho-pneumonia and lobar pneumonia in man are essentially relative rather than absolute, and depend mostly on the ability of the lung to localise the original infection by an inflammatory reaction. We seem to have here evidence that the progressive spread of severe acute lobar pneumonia, which is so striking a feature of the disease anatomically and clinically, is due to the qualities of the pneumococcus rather than those of the lung involved. The suggestion that dose is relatively unimportant corresponds well with the experience that overcrowding, which is the great practical factor which determines dose in respiratory infections, has little to do with the occurrence of the disease.

[1] Jour. of Path. and Bact., vol. xxviii., 1925, by Thos. H. Fairbrother, M.Sc., F.I.C., F. A. Mason, M.A., Ph.D., F.I.C., W. H. Perkin, F.R.S., and Arnold Renshaw, M.D., D.P.H.

RESEARCH ON DISTEMPER.

SOME years ago the resemblance between distemper and influenza associated in a common effort those who love their fellow men and those who see in them only one more reason for admiring dogs. Since 1923 the Medical Research Council has coöperated in the work on distemper undertaken by the *Field*, and at specially constructed premises near Mill Hill much has been done under a technical committee nominated by the Council. The special study of filterable viruses associated with distemper was entrusted to Dr. P. P. Laidlaw, with the coöperation, in particular directions, of Mr. C. C. Dobell, Dr. W. E. Gye, and Mr. J. E. Barnard, and it is greatly to be hoped that the conclusions reached, or at least the methods devised, by the two last in their work on cancer may prove of value in elucidating distemper. In the meantime, however, much necessary preparatory work has been done, and useful knowledge has been acquired about the propagation and spread of the disease. Its contagion is remarkably easily conveyed—e.g., by the hands, boots, or clothing of persons who have been in contact with dogs suffering from the disease—and it was necessary to erect elaborately insulated buildings in which to carry out the experiments. A fence which cannot be climbed surrounds them, and in the wall of the compound is a cleansing room which is the only means of going in or out, and in which all who enter must abandon their garments, take a bath, and put on sterilised clothes. The exact risk of the carriage of infection by flies is still unknown; but, although it has not been possible to protect all the kennels from them, their exclusion from the hospital is strictly enforced. It has been difficult to provide a supply of dogs perfectly free from infection and free from any acquired immunity. To produce these "clean" and susceptible subjects several generations have been bred under controlled conditions, and the investigators are now suitably supplied. Canine distemper, however, occurs in ferrets, and the use of these animals, which should be popular with rabbits, has led to economy in effort and expense. Moreover, it is hoped that a mild form of virus may be obtained from ferrets which will be useful in producing immunity in dogs. The *Field* should have high appreciation in the medical profession for its contribution to this sound and important work. Apart from the ever-present chance of research on one subject throwing light on another, the fact that man has modified canine evolution and

fashioned the races of dogs in accordance with his own ideas to be his servants and friends, makes him responsible for compensating them out of the fruits of his increasing knowledge.

MEMORIAL TO THE LATE DR. HERBERT WILLIAMSON.

ALTHOUGH he died in the plenitude of his powers, Dr. Herbert Williamson had been for nearly 20 years a member of the staff of St. Bartholomew's Hospital, where it was early recognised that he had beyond other men the gift of imparting knowledge. The proposal is therefore peculiarly fitting to establish a memorial to him in the hospital itself, and it is made with the full approval of the medical council of the hospital. The form which the memorial takes must depend upon the sum subscribed, but it is hoped that at least a sufficient amount may be secured to endow a bed in the department in which he worked. Subscriptions from Dr. Williamson's former colleagues, students, and friends may be sent to Mr. J. Barris, F.R.C.S., 50, Welbeck-street, London, W. 1.

THE PRICE OF GOVERNMENT ISSUES.

ON the occasion, some three years ago, of the publication of the Annual Reports of the Registrar-General for England and Wales and for Scotland, we remarked on the high and increased price demanded for these valuable issues. We were moved to comment by the fact that the preliminary figures issued by the Registrar-General at that date happened to be of vital interest to all public health authorities, so that a restricted circulation, due to high cost of purchase, could only be regarded as of real public disadvantage. Especially did it seem that the prices demanded would constitute a distinct penalty upon public health officers, while it was urgently important that these officers should have them under their hands for reference—indeed, all medical men requiring to verify the statistical bases of their work should have access to them. We learn therefore with pleasure of certain circulars from the Ministry of Health, admitting that the price of the Registrar-General's statistical reviews has been a subject of real concern to the Ministry, and proposing to mitigate the situation in important directions. The effect of the circulars is to offer the "Tables Part I—Medical" and "Text" volumes of the Statistical Review to public authorities and medical officers at a reduced price of 12*s*. 6*d*. per annum (instead of £1) on condition (1) that a subscription is taken up for five years and (2) that a sufficient response is received to justify an enlarged edition. The authorities are also informed that it is within their power to incur expense in providing the volumes for the use of their medical officer.

Even when protesting against the price demanded for these publications we were aware of the difficulty in which the Ministry were placed and would be placed, by the attempt to lower the figure, and we are not surprised to learn that even at the present prices the publication entails a heavy loss on the Exchequer. We have here the position with which publishers of scientific works are always faced, for in the nature of things they are dealing with two irreconcilables—the cost of production must be very high because of the special character of the work, and for the same reason the circulation cannot be widespread. But drastic curtailment in the scope of such work is the last thing that the medical profession or the public services would desire. Economy at such a cost would be disastrous. The only practical policy is to increase in every way the circulation, for no one would consider as a practical proposition the whittling down of the information contained in the reports until their practical utility was gone. The absence of a sufficient number of purchasers is the key to the situation, but it can hardly be expected that public health officers will find at their private expense the money to buy documents required in discharge of their public duties, especially when the sum required is considerable. The indication from the Ministry of Health to the local authorities that they have legal power to purchase the Statistical Reviews for the use of their medical officers removes at once an obstacle to a more general employment of these volumes, and in this way helps to solve the problem. The special price will not be confirmed until it is seen whether sufficient support is forthcoming, and the responsibility is now with the public health authorities and services for accepting the welcome opportunity offered. As is suggested above, the volumes are of obvious use to others besides those for whom the new arrangement has been designed especially; not only official departments and medical practitioners, but the public, through public libraries, may be moved to be purchasers, and by swelling the bulk of the circulation bring down the price of the volumes to a lower level.

POST-GRADUATE EDUCATION IN LONDON.

THE Minister of Health has appointed a Committee "to draw up a practicable scheme of post-graduate medical education centred in London." The Committee, whose chairman will be the Minister of Health himself, is constituted as follows: Lord Dawson of Penn, Sir Humphry Rolleston, Sir John Bland-Sutton, Sir Thomas Horder, Sir George Newman, Sir George Blacker, Prof. Hugh MacLean, Dr. R. A. Bolam, Dr. H. G. Dain, Mr. H. J. Paterson, Dr. J. Parkinson, Dr. H. L. Eason, and Mr. A. E. Webb-Johnson. The appointment of this Committee follows closely on the visit to this country of the Inter-State Post-Graduate Assembly of America, when Dr. Charles Mayo repeatedly advocated the foundation in London of a graduate school which should draw students from all quarters of the English-speaking world.

MEDICINE AND THE LAW.

Case of Alleged Malpraxis: Withdrawal of a Claim.

AN interesting case was recently heard before Mr. Justice Fraser, when damages were sought from Dr. R. G. Clements by an employee in the tramways department of the Manchester corporation for alleged malpraxis. The plaintiff had been attended for rheumatism, and his statement was to the effect that he had suffered no pain in his eyes until the doctor's assistant "flicked some powder from a box into them." Medical evidence for the defence showed that the plaintiff's condition could not have been caused by the drug, but that rheumatism, for which the plaintiff was first treated, and his eye-trouble were due to the common cause of an autogenetic poisoning. The defendant gave evidence, supported by specialists, to the effect that the general condition of the plaintiff and the condition of the eyes were due to a focus of poisoning which affected different parts of the body at different times, and before the medical evidence for the defence was completed the plaintiff's counsel intimated that he did not consider it right to go so far as to leave the case to be decided by the opinion of a jury. He withdrew on plaintiff's behalf every aspersion of any kind against the defendant, the proceedings having been brought under a misconception of the facts. The judge, in directing the jury to return a verdict for the defendant with costs, stated that there was not the slightest foundation for any suggestion of negligence, that it had been made abundantly clear that there were no grounds for any of the imputations, and that the course taken by counsel for the plaintiff was one that would have been expected from one of such legal experience.

The case is of importance to the medical profession as it illustrates the tendency on the part of patients to jump to conclusions on medical subjects without having the necessary knowledge to support the conclusions. The conduct of the defence was entrusted to the Medical Defence Union.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CXXXIV.

THE TREATMENT OF PSEUDOCOXALGIA.

THE rationale of the treatment of pseudocoxalgia cannot be readily understood without a clear understanding of (1) the nature of the disease, (2) the various suggested causes, and (3) the clinical signs which vary in each phase of the process. As will be seen, treatment is different in the different phases.

Nature of the Disease Process.

Pseudocoxalgia is a condition of the hip-joint commencing in young children between the ages of 5 and 10, until recently not distinguished from tuberculous disease, and identified by means of serial radiograms which show a characteristic cycle of changes in the head and neck of the femur. Clinically, radiographically, and for the purposes of treatment, pseudocoxalgia may be divided into three stages named according to the predominant change in the head of the femur as seen in the X rays. Normally, in the child, the head of the femur consists of a cartilaginous envelope enclosing a bony nucleus. In the X rays the bony nucleus appears as a dense shadow. The surrounding cartilaginous envelope casts no shadow, but its extent can be judged by the clear space shown between the head of the femur and the acetabulum. The changes of pseudocoxalgia concern both the bony nucleus and the cartilaginous envelope.

In *Stage 1*, the stage of flattening, the head of the femur retains its normal shape as a whole, but the bony nucleus becomes smaller; there is more cartilage and less bone in comparison with the normal. Not only is the bony nucleus smaller but its density is irregular; in parts it is more, in others less opaque than usual.

In *Stage 2*, the stage of fragmentation, the cartilaginous eovelope becomes flattened; it is no longer hemispherical but is spread out over a wide area and the neck on which it sits expands to accommodate it. The ossific nucleus becomes fragmented and in places disappears completely. It is as though the strength of the head of the femur has departed with the disappearance of the bony nucleus, and as a result the cartilaginous envelope has been flattened out by the superimposed body-weight of the patient.

In *Stage 3*, the stage of repair, the cartilaginous envelope retains the flattened expanded form it acquired in stage 2, while the bony nucleus gradually re-forms until a final stage is reached when the ossific centre has filled out the misshapen cartilaginous envelope, leaving only a narrow peripheral margin of cartilage. The time necessary for the completion of this cycle of changes—flattening, fragmentation, and repair—is uncertain. It is usually considered that two or three years elapse before repair is established.

Ætiology.

A number of different causes have been suggested to explain the changes of pseudocoxalgia; of these only two need here be considered—viz.: (1) That pseudocoxalgia is a mild inflammatory condition affecting the head of the femur. The arguments against this are many: Often the condition is without symptoms at any stage, and in nearly every case is symptomless in stage 1. In contra-distinction to inflammatory conditions, such as tuberculous disease of the hip-joint, the radiographic changes precede the clinical signs. Microscopic examination reveals no evidence of inflammation. Abscess formation is unknown. The blood count never shows a leucocytosis. The Pirquet test is usually negative and the Wassermann test is invariably negative. (2) That the condition is due to trauma. The traumatic theory best explains the sequence of changes in the head of the femur. This theory supposes that, following a mild trauma, the blood-supply to the epiphysis is damaged, and the bone cells, deprived of their nutrition, die or at least become decalcified. The cartilage which derives its nutrition from the synovial fluid of the joint remains alive, but with the disappearance of the bony nucleus there is nothing to retain the shape of the epiphysis which, therefore, is flattened out under the influence of the body-weight of the patient. Eventually, the vascular supply is restored and new bone is laid down, but not before the epiphysis has become mis-hapen and deformed. Pending a more exact knowledge of pseudocoxalgia the acceptance of this theory is justified when the results of treatment based on the theory are reviewed.

Clinical Signs: Management.

As noted above, the clinical signs and symptoms, as also the treatment, vary with the stage of the disease.

In *Stage 1* there are few or no clinical signs, and for this reason only a few patients with the early changes of pseudocoxalgia come under observation. There may be a limp, and careful examination will reveal a slight limitation in the range of movement at the joint; the X rays will show the characteristic change in the head of the femur. Various authorities, particularly on the continent, have stated that treatment will not prevent the characteristic cycle of X ray changes. Observation on the effect of treatment in early cases of pseudocoxalgia does not confirm this statement. It is true that even with efficient treatment fragmentation does occur—one cannot diagnose the condition as pseudocoxalgia without; but I am convinced that if the patient is seen early—before the cartilaginous capsule has become flattened and spread out—this flattening can be prevented by the removal of superincumbent body-weight, so much so that when repair has taken place it may be difficult to tell which hip has been affected. It is important to prevent the flattening; the flattening leads to a large expanded head which will not fit into the socket of the acetabulum and the function of the joint is thereby impaired. The relief from weight-bearing should be continued until sufficient bone has been re-formed in the epiphysis to bear the body-weight without danger of the head becoming deformed. If the body-weight is removed the epiphysis does not flatten and the fragmentation of the bony nucleus is not so clearly shown and it is therefore difficult to know when the stage of regeneration has commenced; in view of this uncertainty six months' relief from weight-bearing should be the rule. The surest way of doing this is to confine the patient to bed; but the patient may be allowed up on crutches with a patten on the boot of the sound leg providing the parents can be made to understand that the child must on no account put the foot of the affected leg to the ground. Movement at the hip does no harm. Treatment only aims at preserving the shape of the head of the femur during the stage when it is soft and malleable.

In *Stage 2* the clinical signs are those of irritation of the joint, and may exactly simulate those of an early tuberculous arthritis of the hip-joint—i.e., limp, wasting (usually slight, however), deformity, and limitation of movement in all directions caused by muscular spasm. On the traumatic theory, one may suppose that the signs of irritation are due to the fact that the contour of the flattening expanding head no longer corresponds to the contour of the acetabulum. This stage may be of long or short duration or may even never exist; many cases of pseudocoxalgia do not at any stage reveal their presence clinically. As regards treatment, rest is indicated for as long as the signs of irritation persist. The body is attempting to treat itself on these lines by keeping the joint still by muscular spasm. By rest is meant avoidance of weight-bearing and cessation of movement at the joint. The child should therefore be immobilised on a hip-abduction frame in bed.

Alternately, a plaster-of-Paris spica will enable the child to get about on crutches with a patten on the boot of the good leg to prevent the affected leg touching the ground.

In *Stage 3* the cycle of changes known as pseudocoxalgia are at an end. The active process—whatever it is—has terminated; repair is completed. When, therefore, a patient with pseudocoxalgia is seen in this stage no treatment is called for in respect of the pseudocoxalgia, but the function of a hip-joint that has been altered by the process may be improved. Instead of the normal spherical head of the femur fitting into an exactly similar shaped acetabular socket, the head has an expanded, flattened surface which is markedly different from the contour of the acetabular socket. This incongruity between the shape of the head and the shape of the socket may give rise to two conditions which will impair the function of the joint:—

(1) There may be a limitation of movement preventing normal use of the limb. The important movement that is apt to be restricted is abduction; the leg will not abduct beyond the midpoint (sometimes there is fixed adduction). Now, abduction at the hip is essential for a normal gait. If abduction is impossible, when weight is borne on the affected leg, the pelvis cannot be raised on the opposite side, and to preserve the balance of the body the trunk is thrown over to the affected side, exactly as happens in the gait of a patient with a congenital dislocation of the hip. This "dipping" gait is unsightly and can be overcome by performing a trans-trochanteric osteotomy of the femur and resetting the fractured femur with the lower fragment abducted, as in the treatment of an old tuberculous hip with adduction deformity.

(2) As a result of the asymmetry of the opposed contours of the head of the femur and the acetabulum osteo-arthritic changes occur, causing pain and stiffness and limitation of movement at the joint. The continued irritation, leading to osteo-arthritic changes, can be prevented by an operation at which the head of the femur is exposed and moulded by trimming off its expanded periphery so that it conforms more in size and shape to the acetabular socket. The contour of the head is not changed by this operation, but its size is diminished to such an extent that it will fit into the acetabulum. This does not damage the joint as the remodelled head is covered for the most part with cartilage and fits into an acetabulum lined with normal cartilage.

Summary.

In *Stage 1*, relief from all weight-bearing is required to prevent the softening head from being flattened out by the weight of the body. In *Stage 2*, when signs of irritation are present, rest is indicated—relief from weight-bearing and from movement. In *Stage 3* no treatment is required. In the aftermath of pseudocoxalgia an osteotomy of the femur may be necessary to increase the range of abduction of the limb, or a modified arthroplasty may be desirable to prevent arthritic changes developing in the joint.

GEORGE PERKINS, M.Ch. Oxf., F.R.C.S. Eng.,
Assistant Surgeon, Royal National Orthopædic Hospital.

SUPERANNUATION FOR MUNICIPAL OFFICERS.—The Minister of Health and the Secretary for Scotland have appointed a committee to inquire and report whether any amendments are required in the Local Government and Other Officers Superannuation Act, 1922, and in particular (*a*) whether it is desirable that the scheme of superannuation established by that Act should now be made obligatory on all local authorities; and (*b*) whether that scheme should, with or without modification in respect of particular classes of officers, be made applicable to all persons in the employment of those local authorities, other than school teachers and police. Dr. Drummond Shiels, M.P., is a member of this committee, of which Sir Amherst Selby-Bigge is chairman, and Mr. V. L. Harkness, of the Ministry of Health, secretary.

Special Articles.

THE TUBERCULOSIS CONFERENCE.

LONDON, JULY 6TH–7TH.

THE eleventh annual conference of the National Association for the Prevention of Tuberculosis was held in the Robert Barnes Hall of the Royal Society of Medicine on July 6th and 7th, and reference has already been made to the opening session and to Prof. Pirquet's opening address, read in his absence by Dr. Richard Wagner (Vienna).

Sir William Thompson, Registrar-General to the Irish Free State, submitted a statement showing, for each sex, the tuberculosis mortality under 5 years, 5 and under 10 years, 10 and under 15, and at all ages, in Ireland, per 1000 of the population at these ages, in the years 1911 and 1924.

Year.		Mortality from tuberculosis in Ireland per 1000 population.			
		Under 5 years.	5 and under 10 years.	10 and under 15 years.	All ages.
1911	Males ..	2·09	0·70	0·80	2·14
	Females ..	1·96	0·87	1·48	2·09
	Persons ..	2·03	0·79	1·14	2·12
1924	Males ..	1·00	0·45	0·55	1·41
	Females ..	0·85	0·44	0·89	1·48
	Persons ..	0·93	0·44	0·72	1·45

Bovine Infection in Children.

Dr. A. Stanley Griffith (Field Laboratories, Cambridge University) detailed the results of the investigations he had made since 1911 on human and bovine infections in children and adults. It had been suggested, he said, on purely theoretical grounds, that small doses of bovine tubercle bacilli in milk might be beneficial to children by conferring on them an immunity to the more dangerous human infection. This hypothesis was based on two assumptions: (1) that the bovine tubercle bacillus was less virulent for man than the human tubercle bacillus; (2) that small doses of bovine tubercle bacilli generally produced mild and curable lesions. But there was evidence that the bovine tubercle bacillus had, if anything, a slightly higher intrinsic virulence for man than the human tubercle bacillus, and that the absorption of a small number of bacilli from the alimentary tract might lead to serious and fatal disease in susceptible infants and children. He had made examinations in the cases of two children, aged 2 and 6 years, who died of tuberculous meningitis; in both instances there were only minimal lesions in the mesenteric glands. Moreover, there was little doubt that the vast majority of the cases of surgical tuberculosis of bovine origin were produced by small doses of tubercle bacilli, since in these cases there was clinically no evidence of disease of the alimentary tract.

It was known that an animal already tuberculous is more resistant to an experimental infection than a normal animal. And it was reasonable to suppose by analogy that a child suffering from a chronic form of tuberculosis, whether of bovine or of human origin, may be more resistant to a subsequent infection. There was, however, not the least evidence that the absorption from the alimentary tract of a small number of bovine tubercle bacilli, which produced no lesions, had a significant or lasting immunising effect.

The numerous instances in children and adults of calcareous and encapsuled lesions which no longer contained living tubercle bacilli could only be taken as evidence of a natural immunity which might or might not have been enhanced by the infection.

Anticipatory De-tuberculisation.

In the afternoon the discussion was opened by Prof. Sir Robert Philip, Vice-Chairman of the Association, who outlined the recent progress of the preventive treatment of tuberculosis in children. One suggestion made was that children born of tuberculous parents should be separated at once from any domestic source of infection, as was successfully practised among cattle. But this method only shelved or delayed the risk. Under present conditions of communal life such a child must run the gauntlet of exposure to infection on subsequent occasions. The same fallacy underlay most attempts to obviate exposure to infection. While in earlier years of infancy it was doubtless sound to delay or minimise exposure, we must be careful not to credit the procedure with undue potential.

A similar fallacy attached to procedure based on the "Grancher" principle, in accordance with which delicate children, sometimes wrongly termed "pre-tuberculous," were transferred from dubious home environment to presumably healthy surroundings in the country. It was frequently suggested, and seemed to be generally believed, that the children were thereby saved from infection. In actual fact, most of the children thus taken in hand were already tuberculised. The excellent results frequently attained were to be attributed to heightening of the child's resistance by maintenance of improved environment—in other words, to a progressive de-tuberculisation along natural lines.

Another proposal was that prior to "spontaneous" infection the child should undergo artificial inoculation (vaccination) in order to anticipate the effect of exposure to infection. Various attempts in this direction had been made. According to Calmette's recent adaptation of the principle, the infant was given by the mouth on the third, fifth, and seventh days after birth a measured quantity of tubercle bacilli, the virulence of which had been reduced by repeated culture on a special medium. It was claimed that a temporary immunity to "spontaneous" infection was thereby attained; the claim was supported by encouraging observations on calves, but it had yet to be seen to what extent, in the absence of illness, parents would consent to submit their newly-born infant to inoculation with tubercle bacilli, however modified, and however simple the process might be. Time and intensive education would be required to leaven popular opinion to the necessary extent.

The plan introduced by the speaker under the name "anticipatory de-tuberculisation" proceeded on the assumption that infection practically always took place during childhood, that the occurrence of the subsequent process of tuberculisation might be definitely determined, and that it was possible to limit and counter tuberculisation by a process of de-tuberculisation.

The process of anticipatory de-tuberculisation had two aspects: (1) Environmental. The influence of improved environment on the resistance of the individual was admitted by all and the principle of the sanatorium should be carried into the whole of social life. (2) Antigenic—by the use (percutaneous) of tuberculin. Antigenic treatment should be commenced when the fact of tuberculisation was definitely established.

The remarkably uniform results observed over many years had much impressed him; not only was the local and immediate result satisfactory, but a systemic influence was exerted which tended to be permanent.

Percutaneous Application of Tuberculin.

Dr. Fergus Hewat (assistant physician, Edinburgh Royal Infirmary) gave an account of the percutaneous application of tuberculin which he had carried on for five years among out-patients from the wards and later at the special tuberculosis clinic. The patients included children with well-marked tuberculous cervical glands on which the surgeon did not advise operation, a number of post-operative cases, and also a considerable number of children who showed a positive tuberculin skin test, slightly enlarged cervical glands, and some degree of muscular wasting, and whose parents stated that they were always tired, that they failed to gain weight, and had poor appetites. In some of these children there were ill-defined abdominal symptoms with attacks of colic at intervals, and palpation showed slight resistance of the abdominal wall towards the right lower quadrant of the abdomen.

If the presence of any local source of septic absorption or any disease other than tuberculosis had been negatived, the children were given a test dose of 10 per cent. Moro's tuberculin ointment made up from Koch's original old tuberculin: this was rubbed into the skin, usually below the clavicle, and if a positive skin reaction was obtained treatment was given once a week, the strength of the ointment being gradually increased as the skin reaction became less pronounced.

No symptoms causing anxiety had occurred during the treatment of these children and very rarely indeed in adults; children were somewhat sleepy the day after the application, and showed a varying degree of skin reaction. Severe reactions amounting to eczema were completely healed in two or three weeks by a simple dressing of olive oil. During the treatment the toxic elements of the clinical picture gradually disappeared; in some two or three months the mothers would say that the children were brighter, more willing to play with other children, and had better appetites. Later the record sheets showed a steady gain in weight, the muscular irritability becoming less, and the children appearing less tired; any abdominal symptoms and physical signs disappeared.

Success was achieved in most cases; failures occurred especially among adults, but the regularity of attendance of the patients was a good index of the benefit they received. In children satisfactory results could be obtained from the use of tuberculin, particularly in a type of patient that drifted in an aimless way from one medical agency to another, never really ill and certainly never fully fit.

Ubiquitous Infection.

Dr. Clive Riviere (Victoria Park Chest Hospital) said that it was generally acknowledged that under present conditions in a civilised community infection with the tubercle bacillus could not be avoided, that such infection was dangerous in early infancy, and that in later childhood a very considerable resistance to tuberculosis was encountered. He laid considerable stress on the importance of immunity; it was mainly due to the general tuberclous infection and the immunity it had given that most of us were able to walk about the tubercle-soaked modern world without any obvious risk.

Prof. Louise McIlroy (Royal Free Hospital) pleaded for better institutional accommodation for pregnant tuberculous women and urged the provision of a special sanatorium with an obstetric staff in London or on the outskirts.

In the evening the annual general meeting of the Association was held in the Robert Barnes Hall. An excellent account was given of the work carried on, including propaganda and the conduct of the Burrow Hill Colony, Frimley, and the Association's new films, the "Invisible Enemy" and "Air and Sun," were shown.

Surgical Tuberculosis.

On the second day the conference was presided over by Sir Robert Philip.

The discussion was opened by Sir Henry Gauvain, who expressed his complete agreement with the views of Dr. Stanley Griffith on the importance of dealing with tuberculous milk, and showed slides illustrating the treatment at Alton and Hayling Island. He thought that personal cleanliness in the house was of more importance than roominess in the prevention of human tuberculosis; a clean pig-sty was safer than a clean palace. A false delicacy

sometimes prevented instructions being given to the consumptive as to the necessary precautions. The horizon was widened nowadays; tuberculous arthritis was treated as arthritis in a tuberculous subject and attention no longer concentrated on the local lesion.

No special hospital for the treatment of surgical tuberculosis could be considered complete unless it possessed an out-patient department where discharged patients could periodically be examined, advised, and assisted. On discharge, full, complete, and individual directions should be sent to each parent or guardian. Advice in the choice of occupation and assistance in obtaining suitable employment should be forthcoming as well as medical help. Relapses might occur, deformities might arise, or neglect of simple rules of hygiene might create dangers to be combated and avoided. Facilities were desirable for sending old patients who needed change to open-air camps or holiday homes, particularly those working in conjunction with or under the management of the parent institution. Some cachectic patients, though no longer suffering from active tubercle, urgently required a prolonged stay in residential open-air schools. Others, whose deformities remained in spite of all endeavours to remedy them, should be transferred to a residential technical school for training in a trade suited to their limitations. Without such training restoration to health was insufficient to make them self-supporting, self-respecting citizens.

Prof. J. Fraser (Edinburgh) commented on the very large number of country children with surgical tuberculosis sent into the Edinburgh Children's Hospital, and explained it by quoting the experience of a medical friend who when being shown round a farm noticed a "fevered" cow, obviously heavily infected with tuberculosis, the milk of which was kept for the minister and his family, with the result that Prof. Fraser had to be called in to attend the sufferers. Inspection and supervision of milk were often a dead letter in Scotland; the staff of sanitary inpectors whose duty it was to supervise the production of milk was ridiculously inadequate, and insufficient encouragement was afforded to them in carrying out their duties. The phraseology of the legislation on milk gave him the impression that the wording was arranged to safeguard the producer rather than the consumer. He showed lantern slides illustrating the treatment of surgical tuberculosis at the municipal hospital at Colinton. He thought a word of warning was necessary against the use of mercury-vapour lamps by any except trained workers.

Dr. W. T. Gordon Pugh (C.M.O., Surgical Tuberculosis Service, Metropolitan Asylums Board) gave an account of the work at Carshalton where half the beds are reserved for surgical tuberculosis. He attributed the great improvement obtained nowadays in return of function to improvements in the appliances used and to the fact that a larger proportion of children were now transferred to suitable country hospitals at a comparatively early stage. But he feared that even now some patients were retained in London for weeks, months or even years when they should be in the country. In the first three months of a joint affection even a week's delay in securing constitutional treatment might mean in some cases permanent stiffening instead of complete functional recovery.

The speaker concluded by showing lantern slides illustrating the special spinal and hip frames and carriages used at Carshalton, designed to facilitate the application of heliotherapy, arc-lamp treatment, and gymnastic exercises, while immobilising the diseased part and facilitating locomotion.

General Discussion.

Dr. H. B. Bates (chairman, St. Helens Public Health Committee) initiated a resolution of the conference on the paramount importance of a tubercle-free milk-supply. Councillor Mrs. Dollan (Glasgow) spoke of the lack of courage of those who advocated such half-measures as pasteurisation in dealing with the evil. Prof. Share Jones (Liverpool) wanted full compensation for all tuberculous animals slaughtered for the public benefit. Dr. J. D. C. White (Harrow U.D.C.) elicited from Sir Henry Gauvain an advocacy of the carbon arc lamp for general purposes. Dr. R. M. Fenn (district T.O., West Riding C.C.) mentioned the help the N.S.P.C.C. afforded in obtaining reluctant parents' consent to treatment of their children. Dr. Morgan (T.O., Wallasey) had found that children after their return from institutions lost weight through insufficient hours of sleep, and Dr. A. Brownlee (Glan Ely Tuberculosis Hospital, Welsh National Memorial) called attention to the folly of patients in an advanced stage of phthisis being allowed to return home to infect young children in the family. Dr. W. B. Tomson (Hastings and St. Leonards Tuberculosis Care Committee) mentioned that in Hastings they had utilised the Grancher system; the Brighton Guardianship Society were placing infants in the villages near Hastings.

Sanocrysin Treatment.

The afternoon was given up to the treatment of tuberculosis by sanocrysin. Prof. Holger Mollgaard (Royal Veterinary College, Frederiksberg) said it could not be too strongly emphasised that this treatment was to be considered as a beginning only; clinical experience had already shown that rightly handled it may contribute a great deal to our present possibilities of curing tuberculosis of the lungs. After relating the principal ideas of chemotherapy, founded on the work of Ehrlich and built up on the numerous investigations following in the wake of salvarsan, he went on to develop the essentials of a rational chemotherapy of tuberculosis in which the peculiar features were the resistance of the tubercle bacillus due to its contained fatty substances and the poverty of the tuberculous tissues as regards blood-vessels. Any bactericidal agent to influence tuberculosis must be capable of penetrating the fatty system of the tubercle bacillus and be capable of reaching the tubercle bacillus by diffusing from the blood through the tissue at a rate faster than it is decomposed in or excreted from the human or animal body. Up to the present sanocrysin, the sodium salt of auro-thio-sulphuric acid, was the substance which best fulfilled the required conditions; the therapeutic agent was the negatively-charged ion AuS_2O_3.

Extensive animal experiments by Dr. Madsen and himself had established: (1) That sanocrysin is able to produce an acute, very severe intoxication in highly tuberculised individuals when injected in doses of 0·5 to 1·5 cg. per kilo. (2) That this intoxication exhibits all the principal features of tuberculin shock and does not occur in healthy animals, even when much larger doses are injected. (3) That the intoxication can be prevented or alternatively cured by means of a specific serum made by immunisation of healthy horses with killed tubercle bacilli. This meant that it was possible to confer upon tuberculous animals or human beings a specific immunity against the lethal effect of sanocrysin, and proved that the substance had a bactericidal influence on the tubercle bacilli in the organism and that the acute intoxication was due to liberated toxins. From the animal experiments they had learnt that the condition of absence of reaction to sanocrysin meant one of three things: (1) Sterilisation until negative results of guinea-pig tests or in Madsen's experiments until negative result of the inoculation on Petroff's medium. (2) Total immunity with loss of the Pirquet reaction, but without sterilisation. (3) Simple failure to react because the residual bacilli are too well protected by fibrous tissue or calcareous matter. In these cases the Pirquet reaction persists. In the human subject they had observed the last two conditions. To prove the existence of the first in a hospital clinic would probably be very difficult.

In the animal experiments the transitory stage between the disappearance of the clinical signs of tuberculosis in the lungs and the definite loss of

reactions to sanocrysin was marked by "late reactions"—i.e., the reactions appeared two or three days after the sanocrysin injection. This fact was in close accordance with the power of sanocrysin to remain for several days in the blood and to diffuse through animal membranes. In the animal experiments the late reaction had been found only in the last stages of the cure, when the greater proportion of the bacilli had been got rid of. Clinical experience had, however, shown that in tuberculous man late reactions very often occurred at the beginning of the treatment. Such reactions had been found three and even five days after the sanocrysin injection, a fact of great importance because it meant that the injection of a fresh dose within this interval might bring upon the patients the risk of a cumulative effect of the liberated toxins.

The combined sanocrysin-serum treatment had brought about the clinical cure of calves and goats which had been severely artificially infected. Spontaneously infected monkeys, even when in a very serious condition, had been clinically cured, with disappearance of all objective signs of tuberculosis of the lungs, marked decrease of abdominal tumours, and large increase in weight. A year after treatment they were still healthy. The intracutaneous reactions in 12 spontaneously infected calves compared before and after treatment showed that five had lost this reaction and in three cases it had been reduced to the limit recognised in Denmark as representing a cure. In three cases the reaction had remained unaltered and in one case it had grown bigger. As the second tuberculin test was made four months after the treatment, it seemed probable that the loss of reaction was due to a real sterilisation.

Prof. Knud Faber's paper was published in full in THE LANCET of July 11th.

Prof. S. Lyle Cummins, C.B. (University College, South Wales and Monmouth), in a preliminary note said his experience was limited to eight cases, six only of which had been specially selected as likely to respond favourably to sanocrysin treatment. Of the unsuitable cases (the acute pyrexial type with pneumonic symptoms) one had already had five doses of sanocrysin, had suffered very severe reactions and was no better, perhaps rather worse, as a result. Of the other case it was still too early to speak as only two doses had been given, the reactions being very severe. All the selected cases had done well, and the improvement noted in them had been so much more rapid and so much more dramatic than could have been expected in cases of this type that he was unable to avoid the conclusion that sanocrysin was the favourable factor in each of them. His experience led him to think that we should safeguard the use of sanocrysin, not so much by reducing the dosage as by selecting patients with tuberculous lesions of relatively small extent. It would require years of observation and a careful following up of all the cases to decide whether the favourable results so far recorded are permanent.

SIR JOHN MACALISTER MEMORIAL FUND.

A FUND has been opened by the Council of the Royal Society of Medicine to commemorate the 38 years of service of Sir John MacAlister as secretary of the Society. The memorial is to take the form of a portrait to be placed in the Society's house. The list of subscribers to date is as follows:—

Dr. Peter Abercrombie, Dr. James Adam, Prof. J. George Adami, Mr. J. E. Adams, Sir Maurice Abbot Anderson, Dr. W. K. Anderson, Dr. H. Russell Andrews, Mr. Herbert Apperly, Sir Robert Armstrong-Jones.

Dr. Andrew Balfour, Mr. W. Girling Ball, Sir Charles Ballance, Dr. Charles Banks, Dr. G. F. Barham, Lady Barrett, Mr. J. Kingston Barton, Mr. Harold S. Barwell, Dr. E. Clifford Beale, Dr. W. Blair Bell, Sir James Berry, Lady Berry, Sir John Bland-Sutton, Mr. G. F. Harrison Bloom, Dr. Robert A. Bolam, Dr. Elizabeth Bolton, Dr. W. Cecil Bosanquet, Mr. H. Edmund G. Boyle, Dr. Charles R. Box, Mr. G. A. Bradnack, Dr. Edwin Bramwell, Mr. Elmore Brewerton, Sir J. Charlton Briscoe, Mr. W. Rowley Bristow, Dr. George S. Brock, Dr. Alfred Brown, Sir Charles Brown, Dr. J. Mitchell Bruce, Sir Bruce Bruce-Porter, Mr. A. H. Burgess, Dr. Dudley W. Buxton.

Dr. Harry Campbell, Mr. Percival S. Campkin, Dr. J. Walter Carr, Dr. George C. Cathcart, Sir Francis Champneys, Sir R. Havelock Charles, Mr. Arthur H. Cheatle, Sir G. Lenthal Cheatle, Sir W. Watson Cheyne, Mr. C. C. Choyce, Dr. J. F. Christie, Dr. J. B. Christopherson, Sir William Church, Dr. A. J. Clark, Mr. Ernest Clarke, Mr. F. J. Cleminson, Mr. H. S. Clogg, Dr. F. William Cock, Dr. E. A. Cockayne, Mr. Frank Coleman, Mr. Lionel Colledge, Dr. M. A. Collins, Sir Frank Colyer, Dr. Donald E. Core, Mr. Edred M. Corner, Sir Maurice Craig, Mr. Arthur Crook.

Mr. H. Morriston Davies, Mr. E. D. D. Davis, Lord Dawson of Penn, Surg.-Comdr. G. O. M. Dickenson, Mr. Alban Doran, Dr. Ernest Dore, Dr. J. J. Macwhirter Dunbar, Dr. J. Gray Duncanson, Mr. E. Craig Dunlop, Mr. Frederic Durham.

Dr. C. C. Easterbrook, Dr. Wilfrid Edgecombe, Mr. R. C. Elmslie, Dr. A. Geoffrey Evans, Dr. William Ewart.

Mr. C. H. Fagge, Dr. John S. Fairbairn, Mr. H. A. T. Fairbank, Dr. John Fawcett, Dr. Douglas Firth, Dr. Robert A. Fleming, Dr. H. Morley Fletcher, Dr. Rosa Ford, Dr. David Forsyth, Dr. R. Fortescue Fox, Mr. Philip Franklin, Mr. J. S. Fraser, Dr. Herbert S. French, Dr. A. R. and Mrs. Friel, Mr. Edward P. Furber.

Dr. W. T. Gardiner, Mr. George E. Gask, Dr. C. Chapman Gibbes, Mr. Harold D. Gillies, Mr. Bryden Glendining, Dr. Lewis G. Glover, Dr. E. E. Glynn, Mr. C. H. Golding-Bird, Dr. W. N. Goldschmidt, Mr. G. Gordon-Taylor, Dr. Albert A. Gray, Dr. A. M. H. Gray, Dr. Emile de Grosz.

Mr. Arthur J. Hall, Dr. F. de Havilland Hall, Sir William Hamer, Mr. Frank Harvey, Mr. J. P. Hedley, Mr. G. F. Hentsch, Lt.-Col. H. Herbert, Mr. William Hern, Mr. Harvey Hilliard, Mr. Montague L. Hine, Dr. C. Thurstan Holland, Mr. Eardley Holland, Dr. Geoffrey Holmes, Sir Thomas Horder, Mr. C. H. Hough, Dr. Cecil Hughes, Dr. William Hunter, Dr. Arthur F. Hurst, Dr. Arthur J. Hutchison, Dr. Robert Hutchison.

Dr. W. J. Smith Jerome, Dr. A. Mason Jones, Sir Robert Jones.

Mr. Frank Kidd, Mr. T. Pomfret Kilner, Dr. T. Percy C. Kirkpatrick, Mr. Albert Kisch.

Dr. G. H. Lancashire, Sir W. Arbuthnot Lane, Mr. William Lang, Mr. J. B. Lawford, Mr. T. B. Layton, Dr. James Leask, Dr. Henry A. Lediard, Mr. T. P. Legg, Mr. Hugh Lett, Mr. H. Levin, Dr. A. Goodman Levy, Mr. A. H. Levy, Sir William T. Lister, Mr. J. P. Lockhart-Mummery, Sir H. Bell Longhurst, Mr. George John Lucas, Sir Henry Lunn.

Dr. Charles J. Macalister, Sir Donald MacAlister, Dr. Anthony McCall, Dr. John McCrea, Dr. J. A. Macdonald, Dr. P. W. Macdonald, Mr. Robert McKay, Dr. Dan McKenzie, Dr. S. Ridley Mackenzie, Dr. Ashley W. Mackintosh, Sir Ewen J. Maclean, Dr. J. M. H. MacLeod, Dr. Arthur J. McNair, Maj.-Gen. Sir W. Grant Macpherson, Dr. John C. McVail, Mr. E. Distin Maddick, Sir George H. Makins, Mr. John D. Malcolm, Mr. George P. Male, Mr. H. J. Marriage, Dr. Cecily M. E. Maude, Dr. J. Preston Maxwell, Dr. H. Crichton Miller, Sir William Milligan, Dr. P. S. Mimbela, Dr. R. Pryce Mitchell, Dr. T. K. Monro, Dr. Irwin Moore, Mr. William James Moore, Mr. John Morley, Mr. Rutherford Morison, Sir Henry Morris, Dr. R. J. Morris, Sir Frederick Mott, Sir Berkeley Moynihan, Dr. George R. Murray, Dr. John Murray, Dr. J. A. Murray, Dr. Nathan Mutch, Dr. Bernard Myers, Dr. Charles S. Myers.

Dr. David Nabarro, Dr. A. E. Naish, Mr. Humphrey Neame, Dr. E. A. Neatby, Mr. V. E. Negus, Mr. Cyril A. R. Nitch, Dr. Hubert J. Norman.

Dr. David Ogilvy, Dr. Martin Oldershaw, Mr. John F. O'Malley, Dr. John Owen.

Mr. Herbert W. Page, Mr. Stephen Paget, Dr. R. H. Paramore, Mr. Charles A. Parker, Sir Thomas Parkinson, Dr. William Pasteur, Mr. J. Lewin Payne, Mr. Herbert S. Pendlebury, Dr. Gerard Petit, Mr. G. R. Phillips, Dr. Robert C. Pierret, Dr. G. Newton Pitt, Sir R. Douglas Powell, Sir D'Arcy Power, Mr. Douglas S. Pracy, Mr. R. W. Prentice, Dr. Owen Pritchard, Mr. L. P. Pugh, Sir James Purves-Stewart.

Miss May Rathbone, Mr. R. Lindsay Rea, Dr. M. B. Reichwald, Dr. George Rice, Mr. Charles F. Rilot, Dr. Clive Riviere, Sir John Robertson, Dr. Alfred R. Roche, Sir Leonard Rogers, Sir Humphry Rolleston, Dr. T. A. Ross, Dr. Amand Routh, Dr. J. S. Risien Russell, Mr. E. Canny Ryall, Dr. John A. Ryle.

Mr. Louis Savatard, Dr. Mary Scharlieb, Mr. C. Schelling, Mr. Sydney Scott, Dr. James Searson, Dr. James H. Sequeira, Sir Seymour J. Sharkey, Dr. H. Batty Shaw, Dr. Edward B. Sherlock, Mr. James Sherren, Dr. W. Knowsley Sibley, Dr. Charles Singer Dr. Harold Sington, Mr. E. G. Slesinger, Dr. Heywood Smith, Mr. J. Priestley Smith, Dr. R. Percy Smith, Mr. Ivan S. Spain, Dr. Herbert R. Spencer, Mr. Walter G. Spencer, Mr. W. T. Holmes Spicer, Dr. E. I. Spriggs, Dr. Graham Steell, Dr. W. Gream Stone, Dr. Florence A. Stoney, Dr. Septimus Sunderland, Dr. W. S. Syme.

Dr. James Taylor, Sir StClair Thomson, Sir John Thomson-Walker, Dr. H. Letheby Tidy, Mr. Herbert Tilley, Sir Nestor Tirard, Dr. J. A. Torrens, Dr. A. Logan Turner, Mr. G. Grey Turner, Dr. William Turner, Dr. W. Aldren Turner, Dr. G. de Bec Turtle.

Mr. George E. Waugh, Dr. Lennox Wainwright, Dr. Jane Walker, Mr. F. Ashton Warner, Dr. W. M. Crawford Watson, Dr. Patrick Watson-Williams, Mr. A. E. Webb-Johnson, Mr. E. F. White, Dr. J. Douglas C. White, Mr. R. H. Anglin Whitelocke, Dr. T. Stacey Wilson, Dr. Thomas Wilson, Dr. T. Outterson Wood, Dr. A. Stanley Woodwark, Dr. H. W. Wunderly, Dr. F. Wyatt-Smith, Dr. Andrew Wylie, Dr. Andrew Ellis Wynter.

The total received to date is £615. The list is still open and subscriptions should be forwarded to the hon. treasurers, Royal Society of Medicine, 1, Wimpole-street, London, W. 1.

NATIONAL HEALTH INSURANCE AND THE MEDICAL SERVICES IN THE IRISH FREE STATE.

(FROM OUR DUBLIN CORRESPONDENT.)

A VOLUME of appendices to the Interim Report of the Committee of Inquiry on National Health Insurance and the Medical Services was issued last week. It contains the various memoranda submitted to the Committee, together with a summary of the evidence given by the witnesses. Nowhere in the evidence is there any opposition to the establishment of a national medical service for the Free State.

The strongest case in its favour was made by Dr. J. Power of the Irish Medical Committee, who received strong support from unexpected quarters. Mr. R. J. P. Mortished, speaking on behalf of the Irish Labour Party, found that a State Medical Service would be very desirable. The General Council of County Councils took the same view definitely in the following opinion:—

"We recommend the establishment of a State Medical Service paid by the State and appointed under arrangements made by the State Health Authority. If it should be found impracticable to establish this service immediately, the promised legislation should make provision for its establishment as soon as possible, and the health scheme should be drafted with a view to its eventual establishment."

As some misunderstanding appears to have arisen as to the precise meaning of this recommendation, the General Council of County Councils was asked to submit a supplementary statement. The secretary of the Council then wrote as follows in regard to his evidence:—

"During the course of my evidence the chairman suggested that the General Council should consider the relative merits of the making of appointments under a State Medical Service, (*a*) by the central health authority, or (*b*) by the local health authority from a panel submitted by the central authority. I have consulted the Executive Committee of the General Council on the subject, and am directed to state that, in their opinion, appointments to a State Medical Service should be made by the central health authority on the results of competitive tests—practical, as far as possible. They are of opinion, further, that in the conditions of appointment to a State Medical Service provision should be made for periodical tests of continued professional fitness."

The importance of the advocacy of a State Medical Service by the representative body of the county councils lies in the proof of willingness of these bodies to rid themselves of a patronage they possess at present. Equally important with the support of the county councils is that given by the Department of Local Government and Public Health. A memorandum submitted by the Department in reference to recent administrative changes in regard to medical treatment of the poor says that the Minister, in the changes he has so far made, has kept in view the possibility of a State Medical Service being introduced at a later date, and has been careful to say nothing that might militate against its being set up.

RADIUM AT THE NEW TORBAY HOSPITAL.—Miss V. E. Wills has given £6300 towards this hospital. Of the total such sum between £2000 and £4000 as may be necessary is to be used for the purchase of radium, and a further £500 is allocated for the construction and equipment of a radium room.

PROCESSIONS AND BALLOTS FOR HOSPITALS.—The authorities of the Church of Holy Trinity, Sloane-square, London, have protested to the Council of the Metropolitan Hospital Sunday Fund against the practice of holding Sunday processions of "men, women, and children dressed in weird and often vulgar costumes, the processions being the pretext for a lot of shouting and shaking of money-boxes," and of "appealing to the gambling spirit in issuing handbills on 'how to win a fortune for half-a-crown.'" It was pointed out that these processions are organised by an independent committee which gives the proceeds to the hospitals of its choice, but not necessarily to one hospital. The subject of "ballot appeals" was referred to the General Purposes Committee with instructions to report to the Council.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following table gives some of the statistics for 1924 of a group of two county boroughs, one city, and four boroughs:—

Name of borough.	Estimated mid-year population (R.-G.).	Birth-rate.	Death-rates per 1000 of the population.				Death-rates per 1000 births.		
			All causes.	Tuberculosis.	Cancer.	Resp. diseases with influenza.	Neonatal mortality.	Infant mortality.	Maternal mort. from childbirth.
Croydon C.B. ..	196,000	17·6	11·6	0·96	1·5	2·3	29	56	2·9
Eastbourne C.B.	54,830	12·1	10·9	0·79	1·5	1·6	40	58	—
Swindon B. ..	56,570	17·1	10·8	0·94	1·4	2·4	32	63	1·0
Worcester C. ..	50,220	17·2	13·3	0·97	1·2	2·9	22	51	1·1
Colchester B. ..	43,940	16·9	11·3	0·86	1·4	2·0	—	45	0·0
Hyde B.	33,770	14·7	14·0	1·10	1·6	2·7	46	103	4·0
Yeovil B.	16,060	17·6	10·8	0·87	1·3	1·6	42	78	3·5

C.B. = County Borough. C. = City. B. = Borough.
— = information not available from report.

Croydon.

Dr. H. P. Newsholme's report on the public health and school medical service marks an advance all along the line. Unification of the medical and nursing services has been achieved. Each health visitor is now responsible for all forms of health-visiting and school-nursing in her district. The school medical officers are also medical officers to the infant welfare centres, and each one is made responsible for the supervision of the health of the children attending a particular group of schools.

Negotiations have been completed for the extension of Cheam Sanatorium from 50 to 85 beds. There will then be 40 beds for tuberculous patients from Croydon, 40 for Surrey, and 5 for Kent. Early in 1925 the council approved a scheme for the development of occupational work at Cheam. The maternity hospital, St. Mary's Hostel (17 beds), is conducted by the Croydon Mothers' and Infants' Welfare Association, which is subsidised by the council. An additional subsidy for the purpose of extending the hospital and providing 13 additional beds is to be paid, and the council have approved proposals for the erection on a site adjoining the hostel of a new building at a cost of £6330. The new building will provide accommodation on the ground floor for an infant welfare centre and antenatal school, massage, dental and eye clinics, while the first floor will provide a sick nursery of 12 beds, one isolation cubicle, a ward of two beds for nursing mothers, and quarters for the resident staff.

Tuberculosis care work is to be handed over to the Croydon Council of Social Service, a voluntary organisation which coördinates many social activities, and includes representatives of official bodies. The council will provide an organiser trained in social work to assist the tuberculosis officer and the Council of Social Service. An occupation centre for the mentally defective has been established and is giving good results. Another new departure is an arrangement with the governors of the Croydon General Hospital for a public laboratory on an extended scale. Formerly the corporation bacteriological work was carried out at the hospital for infectious diseases. Under the new arrangement the Croydon General Hospital will provide a suitable building for the laboratory. The pathologist will be a salaried officer of the corporation and an honorary officer of

the hospital, and will carry out all the pathological and bacteriological work required by the corporation and the hospital. The new arrangement is welcomed by the medical practitioners of the town. Early in 1925 arrangements were approved for the home nursing of measles, whooping cough, ophthalmia neonatorum, puerperal fever, epidemic diarrhœa, and infantile paralysis by the Croydon Nursing Service at a fixed charge to the corporation of 1*s.* 4*d.* per visit for such cases as are referred by the medical officer of health.

The school report concludes with an interesting inquiry into the incidence of adenoids, which is worthy of separate consideration. Adenoids are undoubtedly an important factor in diminishing a child's educational capacity.

Eastbourne.

Dr. W. G. Willoughby reports that the rainfall was 32·73 inches, being about 2 inches above the average for the last 40 years. The sunshine record was 1778·1 hours, which is claimed to be the fourth highest in the United Kingdom, and is 22·5 hours less than the average of the last 37 years. A "peculiar recrudescence" of enteric fever occurred during the year. There were ten cases from January to October, and in all those tested the blood-cultures showed paratyphoid B. No cause could be found, and all the patients recovered. The new male cases at the venereal diseases centre increased from 50 to 58, and the new female cases from 34 to 47. The increase is thought to be due to greater appreciation of the clinic. The existing cases of tuberculosis are being steadily reduced, especially of bone and joint tuberculosis; the deaths from tuberculosis in 1924 numbered 44, compared with an average of 54·7 for the previous ten years. The want of suitable occupation for cases leaving the sanatoria is badly felt, and Eastbourne is no exception as regards imperfection of after-care schemes.

A striking feature of the infant mortality was the large number of deaths during the first weeks of life; thus of 39 infant deaths 27 occurred in the first month One hundred and forty-three confinements took place at the municipal maternity home. Two of the babies were stillborn, and 13 died within ten days of birth. The infant mortality-rate for the first fortnight after birth in the home was 55 per 1000 births. One hundred and forty-four babies were born in the Infants' Home at 9, Upperton-road. Of these six were stillborn, six died on the first day, and two on the eleventh day. Antenatal work is growing, and 263 expectant mothers sought advice at the two antenatal clinics, a high proportion, seeing that the total births numbered 666. Insufficient housing and unemployment, says Dr. Willoughby, are the most serious adverse factors with which the department has to contend. Allowing six persons per house, about 150 houses are required annually to meet the increase of population. During the six years since the war only 465 houses have been completed. A better supply of small houses is needed. "The outlook for 1925 and 1926 is better and houses costing below £600 may be erected."

Swindon.

Dr. Dunstan Brewer again voices the urgent need for an adequate hospital unit in Swindon. During the past year progress has been made in the sanitary conditions of the district. The sewage works at Rodbourne have been completely reconstructed. The storm-water scheme for the newer part of the town was successfully completed during 1924, and despite the wetness of the year no flooding occurred in the lower part of the town. During 1925 it is hoped to reorganise the collection of house refuse by the provision of sanitary dustbins, and to make progress with the reconstruction of public lavatories. The canal is now practically filled up, thus removing an old-standing nuisance. The housing shortage does not diminish, though 299 new houses were erected in the borough during the year. "The position of the larger families becomes relatively and actually worse with each succeeding year." The corporation housing scheme is entirely without the borough. Dr. Brewer believes that it is possible to control scarlet fever, and founds his belief on the theory that scarlet fever is only infectious for the first day or two, but that certain persons possess the capacity of remaining infective for unlimited periods. It is by the control of these few infectors that he hopes for results. Diphtheria ceased to be endemic in Swindon in 1921. During 1924 60 cases of this disease were notified, but for the first year in its history no deaths from this disease occurred in the borough. For the better control of acute infectious diseases of the nervous system Dr. Brewer would like to have all forms of meningitis notified. The report contains an interesting appendix on the maternity and child welfare scheme of the borough with suggestions for its future development. The chief expenditure suggested is on a new maternity and infant hospital built on the pavilion system on an adequate acreage, and making provision for diseases of pregnancy, normal delivery, abnormal delivery, the puerperal state, and non-infectious diseases of infants.

Worcester.

Dr. Mabyn Read records that at the beginning of June, owing to the rapid rise of the Severn, 359 low-lying houses were flooded, and that active steps were taken by the health committee to relieve the consequent distress and to cleanse and disinfect the houses after the flood had subsided. The General Infirmary established during 1923 a fully equipped orthopædic department under the charge of Mr. Norman Duggan, F.R.C.S. In May, 1924, the council appointed Mr. Duggan honorary orthopædic surgeon to their Newtown hospital for the treatment of bone and joint tuberculosis. A satisfactory scheme has thus been provided for the treatment of these patients. In the first place they attend the orthopædic clinic at the General Infirmary, where they receive in-patient treatment, if necessary, and are provided with proper appliances. They then continue their treatment in the open-air wards of the corporation Newtown hospital. It is hoped soon to provide artificial-light treatment as part of the scheme.

Colchester.

Dr. W. F. Corfield reports an increase in respiratory diseases probably due to the wet and cold year, but that the pulmonary tuberculosis death-rate is lower than it has been for many years. Five members of the staff at the isolation hospital contracted scarlet fever. All of them made a good recovery. On the other hand, no cases of diphtheria occurred among the staff, and this result may have been due to the fact that all the junior staff who gave a positive Schick reaction were immunised. There was a decided increase in scarlet fever in the borough; 183 notifications, with five deaths. Two of the fatal cases were imbeciles from the Eastern Counties Institution, and Dr. Corfield points out the low resistance of such children to infections and to a fatal ending. There was a widespread epidemic of measles, with only two deaths, and Dr. Corfield attributes this result to the fact that parents have been educated by the health nurses to regard measles as a serious complaint. Whooping-cough, on the other hand, he says, is not treated seriously enough.

Hyde.

Dr. Nicolas Gebbie refers to the prevalence of pneumonia and respiratory infections and to the removal of the smoke cloud as the most important preventive measure. It will be noticed that Hyde is exceptional in having a three-figure infant mortality-rate, but a chart in the report shows that, whereas the infant mortality was just under 200 for the first five years of the century, it has been just under 100 during the last five years. The new maternity and child welfare centre, opened in June, is a valuable asset, says Dr. Gebbie, "and as a war memorial pays a worthy tribute to the men of Hyde who fell in the

Great War." Photographs and a plan of the building are included in the report. "The present rate of supply of houses in the borough is totally inadequate to meet present needs." Of 25 samples of milk examined for tubercle bacilli, three were found to be infected. In his school report Dr. Gebbie says there is a marked improvement in the general standard of cleanliness, but that inspections at frequent intervals are absolutely necessary to maintain the improvement. In July a committee of teachers arranged a visit to Wembley, and 353 children had to be examined by the medical officer; 51 per cent. of these showed evidence of successful vaccination. A few certificates were withheld on account of "nits" in the hair. The prospect of missing the trip and the energy of the school nurses in using Sacker combs at the clinic produced the desired result, and the withheld certificates were eventually granted.

Yeovil.

Dr. Charles W. Gee reports that the housing shortage still continues, and that a large number of houses are occupied by two or more families. The school care committee continues to provide from voluntary contributions much appreciated assistance to necessitous children who do not come within the scope of the Poor-law. Dr. Gee says an open-air school is badly needed to deal with pre-tuberculous anæmic and debilitated children, and special classes in such a school for dull and backward children. "In the meantime playground classes should be utilised as much as possible."

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 25TH, 1925.

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 65; scarlet fever, 1580; diphtheria, 868; enteric fever, 60; pneumonia, 606; puerperal fever, 44; cerebro-spinal fever, 4; acute poliomyelitis, 6; acute polio-encephalitis, 2; encephalitis lethargica, 50; continued fever, 4; dysentery, 5; ophthalmia neonatorum, 107. There were no cases of cholera, plague, or typhus notified during the week.

Deaths.—In the aggregate of great towns, including London, there were 6 deaths from enteric fever, 44 from measles, 8 from scarlet fever, 39 from whooping-cough, 22 from influenza, and 29 from diphtheria. There were 61 deaths of children under 2 years from diarrhœa and enteritis, as compared with 50, 44, and 29 in the preceding weeks. In London itself there were 9 deaths from diphtheria, 6 from whooping-cough, and none from influenza.

Correspondence.

"Audi alteram partem."

SURGERY BEFORE LISTER.

To the Editor of THE LANCET.

SIR,—In your review of Sir William Watson Cheyne's "Lister and His Achievement," being the first Lister Memorial Lecture delivered at the Royal College of Surgeons of England on May 14th, you say: "There is no reader of our pages but knows what surgery was before Lister's time. . . ." This, I think, is questionable, and the difficulty is to enable the present generation to realise the state of affairs that existed at that period. Even those who experienced something of the fringe of its horrors are apt sometimes to forget the advantages we enjoy to-day and to neglect some necessary precaution, with the result that we are pulled up suddenly only to realise their importance by a calamity. Well do I remember my first visits to a surgical ward in one of the smaller hospitals nearly 35 years ago, where the newer methods of wound treatment had not yet taken root. The surgeon pulling on the silk ligatures which had to be left hanging from the end of an amputation stump was a familiar sight and the regular application of linseed meal poultices to a suppurating tuberculous hip with its sour, sickly-smelling discharge. The earlier stage of a similar case left a still more vivid impression, for I can still see the surgeon incising a tuberculous abscess without any precautions whatever—for he neither removed his coat nor bathed his hands—and inviting me out of the kindness of his heart, for he was a great teacher, to thrust my unwashed finger into the freshly opened abscess so that I might feel the eroded head of the femur!

I have been told that in the old Royal Infirmary at Newcastle there was a "condemned" ward into which post-operative cases were put after a first rigor which so frequently ushered in a fatal septicæmia, and that patients commonly died of septicæmia after such simple operations as amputation of the toe, and that severe sepsis after any operation meant many months of painful suffering often followed by permanently impaired health. As Osler said, only those who have lived in the pre-Listerian days can appreciate the revolution which has taken place in surgery. All students ought to read the story of "Rab and His Friends," by Dr. John Brown.[1] There they will find in beautiful language an accurate description of an old-time operation for removal of the breast with the most wonderful picture of the after progress cruelly marred by the onset of a fatal blood poisoning—a name more embracing and expressive than those now commonly used. I can also strongly recommend "The Edinburgh School of Surgery Before Lister," by Alexander Miles, published by A. and C. Black. From it they will gather a vivid picture of operations in the earlier days and of the great men bold enough to perform them. But there is still room for some work describing the state of wound treatment just before Lister, and it should be done now while those who can most vividly write the story are still with us.

Of course, mention is often made of the conditions existing before Lister, but we require an exact description with some detail as much for educational as for historical purposes. I may be ignorant of what already exists, but the sort of work I have in mind should be easily accessible and suitable for student reading. It would supply a real want.

I am, Sir, yours faithfully,

Newcastle-upon-Tyne, July 31st. G. GREY TURNER.

[1] Reprinted in "Horæ Subsecivæ," second series (A. and C. Black), and in "Collected Short Stories," first series, "World's Classics" (Oxford University Press. 2s.).

THE ÆTIOLOGY OF CANCER.

To the Editor of THE LANCET.

SIR,—I think it ought not to be forgotten that ten years ago[1] Dr. A. S. Leyton and Dr. Helen G. Leyton isolated a streptothrix from sarcomata in rats and reproduced the disease in normal rats. Their procedure was briefly as follows: The press-juice from the tumour was passed through a porcelain filter, cultures were made from the filtrate, and the streptothrix grew. Rats were inoculated with the streptothrix and sarcomata reproduced. Acting on this brilliant piece of work Mr. W. Stevenson and I were able last year to cure a large sarcoma in a woman aged 38. The tumour was situated on the left side of the neck, and was so large that the patient's neck was turned to the right and fixed. Mr. Stevenson had reduced the tumour by about one-third of its bulk by radium. I then removed an intact piece of the tumour and obtained a profuse growth of diphtheroid bacilli (streptothrix). An antigen of this produced marked focal reaction in the tumour and general reaction. The tumour steadily retrogressed with the course of inoculations and completely disappeared. Some months later there was a recurrence in the glands of the left armpit from which I isolated the streptothrix again.

I am, Sir, yours faithfully,

University College, Dublin, July 24th. W. M. CROFTON.

To the Editor of THE LANCET.

SIR,—In your leading article of July 25th on the above subject you state "imagination can run on

[1] THE LANCET, 1916, i., 513.

almost indefinitely and in this case legitimately." With that before me, I venture to add to the flood of hypotheses with the hope that my addition thereto may not be regarded as illegitimately indefinite. I use, or it may be unwittingly pervert, the facts summarised in the Ministry of Health Memorandum (July, 1924) by Dr. J. A. Murray, by Dr. Mervyn Crofton in a paper[1] on Cancer, and the published work of Dr. A. Leitch.

There is no specific germ of cancer. The government of metabolism at sites in the animal body presumably varies in perfection, in accord with the grade of strain to which these are subjected in fulfilment of the respective functions subserved. Local irritation of mechanical, chemical, and toxic origin may be followed at certain sites by interruption of the sequence of processes of maintenance. In the human being more especially this may occur when these factors are aggravated by senescence and faulty dietetics. Independent of phagocytosis in the blood-stream, cell growth may be aided by ultra-microscopic microbes acting direct on effete matters, their influence on which may be restricted by toxic substances possessed by the healthy cell. In the presence of submaximal injury of cells as contrasted with their actual death, a struggle would ensue; in this the scavenger microbe may be at a disadvantage, toxic substances may gain the upper hand. When the process of irritation is chronic, the cells thus guarded would depend largely on physico-chemical processes (as illustrated in vitro experiments with fresh culture medium), and would assume a practically independent and insular existence with a scavenger service reduced to a minimum, if at all existent. Cells rich in toxin would guard the periphery. The toxic substance having fulfilled the function of protection locally might become surplus to requirements (as shown in the experiment in vitro of lack of growth in absence of fresh culture medium) and on entering the circulation would interfere with the scavenger microbe at the particular sites liable to overstrain in functioning, or owing to local irritation as defined above. Hence, there is no specific metastasis. On such an hypothesis cure of cancer would depend upon the judicious and intermittent flooding of the independent cell area (strictly within its confines) with the ultra-microscopic scavengers, in the endeavour to restore the balance of normal growth.

It seems to me that Dr. Gye's conclusion that *two* factors are necessary is met by this hypothesis, and is strengthened by the statement in the memorandum of the Ministry of Health that "the active agent behaves thus far like an ultra-microscopic virus, *but it has not yet been possible to produce the disease with artificial cultures of it.*" (Italics not in the original.) You seem to approach the subject much from the same point of view I express when, in your leading article, you state, "It may turn out that the virus does not normally exist in the body at all, but is generated within it in something of the same relation to the cells as the bacteriophage has to the bacilli."

A further tendency in this direction is found in your mention of the doctrine of Drs. Gye and Cramer involving "defence rupture" (kataphylaxis). My hypothesis would, however, regard Dr. Gye's "particulate bodies" as scavengers whose presence under normal conditions stimulates the production of a defence toxin in proportion to the zeal permissible on their part. When Dr. Gye injects both the particulate body (his "virus") together with the toxin (his "specific factor") he imitates, presumably, in healthy tissue the circumstance of the struggle of the scavengers and the defence toxin in the metabolism incident to submaximal cell injury; and is successful in securing the results he desires, because from the start he handicaps the particulate bodies by upsetting the balance with toxin in excess to the normal of the site. In this view it would be premature to regard the particulate body as a virus. Having regard to the largely accepted local irritation theory in causation of cancer, more light would be thrown on the subject were Dr. Gye's "virus" to be injected without his "specific factor" in tissue which recently has been subjected to submaximal injury.

This hypothesis may be *pour rire* when examined by experts: but I trust it will be regarded as quite as good as that which was accepted some time back as to the baneful effects of tomatoes in producing cancer!—I am, Sir, yours faithfully,

W. G. KING,
Hendon, N.W., August 3rd, 1925. Colonel, I.M.S. (Ret.)

[1] The Bordeaux Congress, 1924.

To the Editor of THE LANCET.

SIR,—Dr. Gye's remarkable researches have aroused intense interest. They have a special interest to me through my association with the work, on lines very similar in theory, of my father, the late Dr. W. Ford Robertson. His paper[1] on the Relation of Carcinoma to Infections describes the result of inoculation of mice with cultures of an anaerobic diphtheroid bacillus isolated from five different human breast carcinoma and one rodent ulcer. He did not filter these cultures as he looked upon this bacterium, universally present under these conditions, as being probably the essential factor. Nineteen out of the 22 experimental mice were inoculated with pure anaerobic diphtheroid cultures in saline which had been subcultured from the primary broth into special anaerobic hæmoglobin glucose agar for the purpose of enhancing purity of culture. On the two remaining mice primary cultures were used. In the light of Dr. Gye's work it would appear that Dr. Robertson deprived the inoculum of some of its virulence, for of the six positive experiments in the group, the resulting tumours did not appear until a lapse of from 9 to 23 months, while in the two cases where primary cultures were used (presumably containing besides the anaerobic diphtheroid bacillus a filterable virus) the period for tumour development was as short as two to three months.

Dr. Robertson's experiments are remarkable, in that out of a total of 22 mice which were inoculated with human cancer anaerobic diphtheroid cultures, without any specific substance, eight developed carcinomata and one sarcoma, and a further nine developed hyperplastic tumours strongly suspicious of malignancy (13 of these being examined and verified by the Laboratory of the College of Physicians, Edinburgh), making a total experimental production of 36 per cent. tumours of definite malignancy, and a further 41 per cent. of suspicious malignancy. Control mice to the number of over 30 were kept for longer periods during the experiments without developing any kind of tumour.

With regard to the specific substance this must have largely been removed by the technique adopted in the majority of Dr. Robertson's experiments, and further, only two mice were inoculated with cultures that might contain specific substance, the others being treated with pure surface subculture in saline, which presumably could not have contained this material. Tumours were produced, however, but in a relatively much longer period, suggesting that owing to the removal of specific substance or its destruction by secondary organisms, further time was required for its redevelopment in vivo, either by unknown toxic factors, the diphtheroid itself, or the virus incorporated with it.

I am, Sir, yours faithfully,
W. MARSDEN FORD ROBERTSON.
Southport, July 28th, 1925.

To the Editor of THE LANCET.

SIR,—There are probably few pathologists in this country who have not already read the most interesting papers on cancer and the ultra-microscopic viruses by Dr. Gye and Mr. Barnard. The work, moreover, has been widely discussed and the results and conclusions

[1] Brit. Med. Jour., 1921, ii., 929.

appear to be accepted as correct by many pathologists. All, however, who wish well for the reputation of British medical science will be anxious lest an over-enthusiastic reception should blind workers to any possible sources of error which a more considered judgment might suggest ought to be thoroughly probed before a work of this nature is accepted as having been *proved* to be correct. Nothing could do greater harm to the reputation of British scientists that they should be shown to be in error, possibly in a year's time, by some worker in a foreign laboratory. I feel sure, therefore, that both Dr. Gye and Mr. Barnard will appreciate the desire of some workers to be given a little more information on several crucial points, a satisfactory answer to which would go a long way towards convincing those whose critical analysis of the results leaves them in some little doubt.

In view of the fact that ultra-microscopic viruses will tolerate pure glycerine and to a certain extent ether, is Dr. Gye convinced that his chloroform-treated filtrate is quite free from the virus or contagion? Might not a small amount of specific contagion be left and be made active by non-specific products, including acids present in what he believes to be his cultures, in the same way that toxins affect the virulence of bacteria? Can he give us some experiments conclusively disproving this possibility? How many times has the experiment given in Chart 5 been made, and has the result always been the same? Have large quantities of the same treated filtrate only been inoculated, as controls, with negative results? Have cultures of non-cancerous tissue been tested side by side with cultures of cancerous tissue when the same treated filtrate was added in each case? In making subcultures from the primary cultures have any comparative experiments been carried out with subcultures made after heating the *primary* culture to such a temperature that any virus would certainly be destroyed? Would a fifth subculture from this fail to be made active by a chloroform-treated filtrate which for certain made active the fifth subculture derived from the unheated primary culture? Such experiments giving clean-cut results would, I suggest, be considered weighty evidence by most pathologists who may not be quite convinced by the result given in Chart 11.

This investigation of Dr. Gye and Mr. Barnard must have a considerable effect on all investigations at present being carried out on the ultra-microscopic viruses, and it is of great importance to other workers that their own investigations shall be carried along the right lines. I am sure if Dr. Gye is in a position to give us the information I have suggested it will be of great assistance to, and will be appreciated by, those working in other laboratories.

I am, Sir, yours faithfully,

F. W. TWORT.

The Brown Institution, University of London, July 20th, 1925.

To the Editor of THE LANCET.

SIR,—Dr. Gye's paper in your issue of July 18th, in which he reports the very important results of his experiments on the passage of the Rous chicken sarcoma No. 1, raises a point of interest which has been in my mind since I first knew of his preliminary work, and which acquires more importance in the light of his more recent results with mammalian tumours. The point concerns the second filterable fowl tumour referred to in his paper—chicken sarcoma No. 7, of the Rockefeller Institute—a tumour which I originally transplanted and passed by filtrates, and the details of which were first published—without my consent—under the names of Rous, Murphy, and Tytler.[1] This tumour I have described separately.[2]

The original of this tumour was an apparently inert, cartilaginous nodule on the keel of the sternum, and during the first few passages the growth remained entirely benign in type—well encapsulated, cartilaginous during the first few weeks of growth, ceasing to grow after six to eight weeks, and then becoming more or less completely ossified, with the production of marrow spaces and blood-forming tissue. At about the fifth or sixth passage, however, it quite rapidly began to take on malignant qualities, and in the course of three or four passages became transformed into a soft, rapidly growing and invading, undifferentiated tumour, and at this stage I was able to pass it by means of a Berkefeld filtrate. The tumour passed out of my hands at this time, and for information as to its later course I was indebted to my former colleague, Dr. J. B. Murphy, from whom I understood that it acquired most of the characteristics of chicken sarcoma No. 1, to which it now bore a striking resemblance histologically, but always retained certain specific qualities of its own.

The point I wish to make, in the light of Dr. Gye's work, is the possibility that this originally benign tumour may have become infected by the active virus of chicken sarcoma No. 1. Numerous fowls bearing the latter tumour—many with large, extensively ulcerated growths—were being handled in the same laboratory, the danger of contagion was not at that time seriously considered, and we did not have the conception of a virus which could outlive the activity of the tissue preparations in use.

The suggestion is entirely speculative and impossible of confirmation, and would, indeed, have a very limited interest in connexion with the fowl tumour alone. But Dr. Gye's work leads us to hope, as I understand, with some justification, that he will be able to demonstrate the activity of his virus in the production of mammalian tumours, and to extend the results of his work to the whole field of malignant growths. In this case, the point I have raised may perhaps supplement in a small way the suggestion contained in his epoch-making work that contagion in cancer may be a factor of importance, a view which will no doubt appear revolutionary to the medical profession as a whole, as it does to me.

I am, Sir, yours faithfully,

W. H. TYTLER.

King Edward VII. Welsh National Memorial Association, Central Tuberculosis Laboratory, Cardiff, July 20th, 1925.

To the Editor of THE LANCET.

SIR,—It is a great pity that your leading article of July 25th did not appear in the same issue as Dr. Gye's communication. The communication was accompanied instead by a leading article which took a purely one-sided view of the question, accepting Dr. Gye's hypothesis as well as his facts, and even going beyond them in suggesting that the "specific factor" may be produced from irritated tissues, whereas Dr. Gye had produced it only from pre-existing tumours. Your article of July 25th took a more judicial attitude, and suggested that there might be another explanation of Dr. Gye's facts than his hypothesis of an extrinsic parasite, but, as far as I have seen, no notice of this second leading article has been taken by the daily press. The impression has thus been transmitted throughout the world that Dr. Gye has discovered the cancer parasite, and this impression is intensified by the unqualified support of the leading medical journal in the kingdom.

Pathologists are apt to ignore, or to regard with contempt, the views as to the constitution of living matter which are accepted by biologists. These views are that the cell is not the ultimate unit of life but is itself composed of different orders of smaller living units each of which is capable of growth and multiplication. Some of these units such as chromosomes, centrosomes, Golgi bodies, chondriosomes, &c., are visible under the microscope and their growth and multiplication can be studied directly. Others are invisible, but their existence is supported by very strong evidence.

According to Weismann the ultra-microscopic particles (determinants and biophores) are specific

[1] Jour. Amer. Med. Assoc., 1912, lix., 1793.
[2] Jour. Exp. Med., 1913, xvii., 466.

in character and determine the nature of the cells of which they form part. Since these views were first promulgated they have received remarkable independent confirmation in the facts of Mendelian heredity. There is little or no difference between Weismann's "determinant" and Mendel's "factor." Both are intercellular and ultra-microscopic, and capable of growth and multiplication. The "determinant" determines the nature of the cell and the "factor" determines the character with which it is associated. It appears to me that here we have an explanation which is in better accord with Dr. Gye's facts than his own hypothesis of an extrinsic cancer "virus."

Since cells can be cultivated under artificial conditions apart from the organisms of which they form part, there is no a priori reason why it should not be possible to cultivate these ultra-microscopic units apart from the cells. It appears to me that Dr. Gye's facts would be explained equally well on this supposition as they would be on his supposition that the "virus" is an extrinsic agent; and, for some of his facts, my suggestion offers the easier explanation. Cancer cells presumably contain an ultra-microscopic "factor" or "determinant" for cancer, and it is quite possible that Dr. Gye has succeeded in cultivating this factor, since he has not brought forward any evidence that his "virus" is an extrinsic germ.

The great majority of pathologists have always recognised that the known phenomena of cancer are incompatible with the theory of an extrinsic specific causal agent, and it does not appear that Dr. Gye's facts have removed the objections to this theory. To take one point only, it is now possible to induce cancer in animals without taking thought of any parasite. If an extrinsic parasite is to be considered necessary for the production of cancer, this organism must be present at all times either in all animals or else in the atmosphere. Otherwise it would be impossible to produce cancer without the specific introduction of the cancer parasite. There is, thus, very strong evidence in favour of the view that this so-called "virus" is not an extrinsic parasite, but is a constituent part of the cancer cell itself. This view is in accordance with the phenomena of cancer, whereas the hypothesis of an extrinsic agent is not. The question whether the virus is extrinsic in origin or is derived from the cancer cell itself is one of extreme importance, and it is much to be regretted that Dr. Gye's article was not submitted to more adequate criticism before being published, so that both sides of the question could have been presented to the public at the same time.

If my suggestion is correct, this work of Dr. Gye opens up vast possibilities in the way of cultivating Mendelian factors in vitro.

I am, Sir, yours faithfully,

CHARLES POWELL WHITE.

Manchester University, August 3rd, 1925.

To the Editor of THE LANCET.

SIR,—Dr. Gye's recent investigations have been of special interest to me, because I believe his virus will prove to be identical with the ultra-microscopic phase of the complex micro-organism which I described in 1921. This micro-organism I have obtained from a large number of cancers of all types. I have shown that the larger elements (coccal, bacillary, fungal) which soon appear in any ordinary culture medium containing a piece of cancerous tissue can be traced directly from minute elements, which emerge from the cells, or indirectly from an amorphous material, which escapes from the cells as globules and rods and which in this early stage is often curiously resistant to ordinary stains. This unstained "plasm" often first appears in and escaping from the dying cells as minute elements just on the verge of visibility. A study of these facts led me to write in 1922 that "the organism has, during its parasitic phase, acquired the faculty of infecting individual cells and of living in a sort of symbiotic relationship with the cells which it inhabits. This conclusion . . . goes far to confirm the view which I advanced in a previous paper (1921) that the organism lives parasitically in a minute phase which is unrevealed by ordinary methods of staining." The globules and rods can sometimes be seen to emerge from the cells with a clearness that is diagrammatic. The organised forms (coccus, bacillus, yeast) often spring from refractile elements, which appear in and are detached from the globule and rod. Glover of New York and his colleagues have recently described a microbe which they have obtained from all types of cancer and whose general characters are similar to mine.

A remarkable feature of this micro-organism is that the alternative forms, although springing from one common stock, can pursue each an individual and stable life as coccus, bacillus, or yeast, and they may resist any efforts to change them, although I have frequently during five years' study convinced myself that under certain conditions any one form can pass over into any other form. These facts are foreign to ordinary bacteriological teaching and have made my views uncongenial to many bacteriologists, although there is a great deal of evidence in the literature to support them (Löhnis, Mellon, de Negri, Hort, Almquist, &c.). It is, I believe, apparent from the recent literature that fixity of form in bacteria is illusory as a criterion of specific characters, for as Löhnis, Mellon, I and others have shown the alternative phases of the same organism can often and probably usually pursue an independent true-to-type existence. It is sometimes urged that such a conception is opposed to the facts of biology. This is not so. It is opposed to much of the traditional teaching of bacteriology, but it is obviously in conformity with the great biological fact that a multitude of different cellular elements, each capable of independent propagation, are commonly derivable from one common germ-plasm. The further back we go in the world of life-forms the more we find the differentiated cell retains its multipotential characters of the original plasm. In the bacteria this retention would seem to be complete. The essential resemblance between the primitive bacterial matrix and the germ-plasm of higher life led me to name the former the bacterioplasm.

The first indications of these facts in regard to the cancer parasite came to me when I discovered that "plasm" rod or globule, minute granule or thread (in this stage strikingly similar to Rickettsia), bacillus or coccus could apparently, depending on the culture medium and other factors, be derived indifferently from the cells of the same piece of cancer. The confirmation of these facts came with the discovery that from the same "plasm" all the different forms were derivable. In this stage the refractile granule is a common index. During this phase the germinating "plasm" is easily mistaken for masses of débris to which the bacterial forms have adhered. As Löhnis has pointed out, in the past it has been commonly looked upon as dirt.

Sir, with the attention now being paid to the cancer parasite I look forward confidently to an early confirmation of these views first published in 1921. For long I have been urging that a similar reorientation of the bacteriological mind would probably quickly resolve the difficulties surrounding typhus, influenza, small-pox, &c. If it be true that Weigl, Breinl, and Fejgin have all succeeded in deriving the *Bacillus proteus* (X 19) commonly associated with typhus from the Rickettsia of typhus, we have the first augury of the unexpected facts which will transpire with the application of this broadened outlook. We can safely prophesy big developments along the same lines in the near future.

That familiar bacteria may possess a filterable phase is suggested by the work of Heymans (*B. anthracis*), Valtis, Vannucci, &c. (*B. tuberculosis*), Almquist (*B. typhosus*), Hort (*meningococcus*), and Löhnis. The very striking investigations of Löhnis

make it likely that all bacteria have a filterable mode of life; it may even be that this is the essential parasitic form of all bacteria.

I am, Sir, yours faithfully,

Edinburgh, August 1st, 1925. JAMES YOUNG.

THE PRINCIPLES OF DYNAMIC PSYCHOLOGY.

To the Editor of THE LANCET.

SIR,—An opportunity, all too brief, occurred for the discussion of psychotherapy at the meeting reported in your last issue of the Medico-Psychological Association in Birmingham. Some of the opinions then expressed may be taken as typical of the progress the medical profession as a whole has made in the acceptance of the principles. Ten years ago it was difficult to obtain a hearing in medical circles for a paper dealing with the value of suggestion. The successes obtained during the war by the exponents of the Seale Hayne school and others, in the treatment of the conversion neuroses altered this, and the profession was bound to admit that suggestion had a definite therapeutic value. Having thus swallowed suggestion whole the profession appears inclined to rest there. If one may judge by the majority of practitioners one meets, the general attitude may be summed up by some such statement as this. "There are certain somewhat eccentric persons who have the power of curing neurotic conditions by suggestion, and there are certain nasty-minded cranks who believe that they can do good by means of a mystic ritual called psycho-analysis. Anyway, neurotic patients are a nuisance and if a bottle of bromide cannot satisfy them, let them go where they will."

There are those of us, Sir, who hold a different opinion. We say that considering the vast amount of misery, social and economic loss, caused by functional nerve disorders, the apathy of the profession, including most of its teachers, is nothing less than tragic. We know that suggestion at the best can do no more than remove some obvious symptom, and does nothing to enable the patient to adapt himself to his environment. It has no effect on phobias or anxieties, it will not cure the psychasthenic, or remove a tendency to criminal outbreaks. In order to treat such conditions as these one must have a knowledge of the workings of each individual patient's mind. One must recognise the existence of a dynamic Unconscious, and realise that the symptoms represent for each patient the satisfaction of some inner need, the solution of some unconscious mental conflict. We realise that an unhealthy body is not without influence on the mind. We do not minimise the importance of tracking down and eliminating all septic foci. We are aware that a dose of calomel may effectively purge melancholy, but we see too many individuals who have been subjected without benefit to every possible minor and major surgical procedure to believe that the root cause of a neurosis can be somatic.

Surely the time has come when students should not leave the medical schools without having learned something of the principles of dynamic psychology. Men when they go into practice will find themselves daily confronted with conditions which neither medicine nor surgery can solve. They will be consulted by women and men whom no examination, however thorough, will convince that they are not the victims of hidden cancer or tubercle. They will be asked to prescribe for adolescent girls who lose both appetite and sleep unaccountably. Healthy youths will present themselves with tales of woe which do not fit in with anything which the student has learned. These, as well as the readily recognisable hysteric and neurasthenic, will try his patience and waste his time and theirs, before taking their troubles elsewhere, unless he has the necessary psychological knowledge to deal with them. More important still, he will have many opportunities of dealing with the beginnings of neurosis in childhood, but he will pass them by.

The teaching I would advocate need not be definitely committed to the theories of either Freud, Jung, or Adler. Once imbued with the idea of the Unconscious as a dynamic force and not a lumber room, the interested student will pursue the subject on his own lines. I would emphasise, however, that as regards the lecturer, the terms neurologist and psychologist are not interchangeable, and it is for his psychological rather than his neurological knowledge that the lecturer should be chosen. An important part of the course would deal with the training of the young child, as it is during the nursery years that the foundations of most neuroses are laid, but something too would need to be said as to the part played in the anxiety states by the sex life of the adult. I am aware that post-graduate courses on these lines are in existence in some centres, but such lectures touch only the fringe of the profession. Such training as I advocate would at any rate enable the student in after life to recognise these cases when he sees them and enable him to advise treatment, even if he did not care to carry it out himself.

It is a mistake to think that there is no choice between neglect and a formal psycho-analysis. An astonishing amount of psychology can be dispensed over the counter, as it were, with lasting benefit to the recipients. Patients are frequently astonished, but never resentful of questions asked about their sex life, and show themselves extraordinarily grateful if the physician is able to point out where the shoe pinches. A varying amount of mental analysis is required in other cases and sometimes may be combined with suggestion, whilst in some other types the analysis must be carried to rock bottom. These last should be referred to recognised experts, but unless we train our students where are these experts to come from? Already this branch of therapeutics is overrun by men and women who have had no medical training. Some of them are honest and competent workers; others are not so, and bring disrepute upon a science which by its very nature arouses instinctive opposition. The value of psycho-analysis is freely recognised by educationists, the clergy are fully alive to its social uses; how long will the medical profession continue to turn the blind eye?

I am, Sir, yours faithfully,

Birmingham, August 4th. R. MACDONALD LADELL.

PUBLIC HEALTH OF MARKET DRAYTON.

To the Editor of THE LANCET.

SIR,—I enclose report of a recent conference at Hales Hall (the rural dean in the chair) which throws some light on the causes of high infant mortality for some years past at Market Drayton, but does not solve the question, "Why does the Minister of Health steadily refuse to publish the report as to the high infant mortality at that little town, made by his own medical inspector last autumn?" We infer from a statement made by Dr. Wheatley, the M.O.H. for Shropshire, on May 9th, that "bad housing and ignorance" were the principal causes, and that "the health education" should begin in the elementary school (*Newport and Market Drayton Advertizer*, May 9th, 1925).

At the conference, reported in the issue of the same newspaper on July 25th, we gather that the medical inspector's report recommended more education, probably including the education of mothers at the infant welfare centre, and help for that centre. The report, we are informed, also stated that "the sanitary record is poor"; and it "suggested the appointment of a woman guardian." Surely this report should be published in full; the ratepayers should be told what improvements should be made in administration by the guardians which a woman guardian could assist; ignorance should be dispelled, the interest of the inhabitants enlisted, and the lives of the infants saved.

I am, Sir, yours faithfully,

August 4th, 1925. J. THEODORE DODD, M.A., J.P.

THE MEDICAL DIRECTORY.

To the Editor of THE LANCET.

SIR,—The annual circular has been posted to each member of the medical profession. If the form has not been received, a duplicate will be sent on request. We shall be grateful for the return of the forms by an early post.—We are, Sir, yours faithfully,

J. AND A. CHURCHILL.

7, Great Marlborough-street, London, W.,
July 31st, 1925.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Bills Advanced.

ON Tuesday, July 28th, the Mental Deficiency (Amendment) Bill passed through Committee in the House of Lords, and the Dangerous Drugs Bill was read a second time. On the same day in the House of Commons the Diseases of Animals Bill was read a third time. On Wednesday, July 29th, in the House of Lords the Diseases of Animals Bill was read a first time, and the Summer Time Bill and the Dangerous Drugs Bill passed through Committee. On Thursday, July 30th, in the House of Lords the Diseases of Animals Bill was read a second time, the Public Health Bill was considered on report and certain minor amendments were agreed to, and the Mental Deficiency Amendment Bill was read a third time and passed. On Friday, July 31st, in the House of Lords the Public Health Bill was read a third time and passed, and the Pensions Bill and the Diseases of Animals Bill passed through Committee. Among a number of Bills to which the Royal Assent was given by Commission was the Mental Deficiency (Amendment) Bill. In the House of Commons on the same day the Lords amendments to the Therapeutic Substances Bill were agreed to.

HOUSE OF LORDS.

WEDNESDAY, JULY 29TH.

Indian Medical Services.

Lord SYDENHAM asked the Secretary of State for India whether measures were in contemplation adequately to fulfil the medical requirements of the Indian army, British residents, official and non-official, and the civil hospitals, and to secure the progress of medical science in all its branches throughout India. He said that we had conferred immense benefits upon the peoples of India by the introduction of Western medicine and surgery. Since Lord William Bentinck opened the Calcutta Medical College in 1835 the Indian Medical Service had grown to be one of the finest—perhaps even the finest—public medical service ever created. It had produced men who had won world-wide reputation, not only for research into the causes, the spread, and the prevention of diseases which afflicted India, but also for the fine work which had been done in educating the Indian students. While this service had always maintained a very high standard of health in the Indian army, to which it specially ministered, its achievements on the civil side had been most remarkable. The hospital system, which we introduced into India, had been spread broadcast over that country, and had been imitated in very many native States. The Indian Medical Service was in the strictest sense a key service, because it not only conserved the health of all the other British services, but it supplied the directive forces in all that might be called sanitation in India. The Indian Medical Service was crumbling away, and it had been necessary lately to send out medical officers on short contract, which was totally unsuitable to the conditions of India. It was essential that the medical officers of India should know the people and their languages and regard India as providing them with a career. This makeshift system could not possibly answer. In recent years there had been a great many inquiries into medical matters in India. The Royal Commission on the Public Services of 1912–15 in their report published in 1917, stated that the Indian Civil Medical Service was being economically and efficiently performed, which was undoubtedly true at that time. The Verney Lovett Report of 1919 proposed a unified service, to be called the Indian Medical Corps, the Indian Medical Service absorbing the R.A.M.C., and special provision being made for the discharge of the civil duties. The Esher Committee of 1919–20 declared that the Verney Lovett plan was the only feasible scheme of unification, but it decided that the amalgamation of the I.M.S. and the R.A.M.C. was at present impracticable. The Lee Commission of last year proposed that the R.A.M.C. should absorb the I.M.S.—which he believed would give rise to a great many administrative difficulties—and that a civil branch should be created which would be 50 per cent. Indian recruited. The Report alluded rather ominously to the requirements of the provinces for a separate medical service. Those words seemed to show that there had been some political pressure brought to bear on the Commission, and he believed that the best British medical graduates would never join a medical service which would quickly become purely Indian whatever proportion they arbitrarily fixed. Under the Act of 1919 all the medical services were made a transferred subject and subsequently a boycott of the Indian Medical Service officers was set up.

India had produced a limited number of medical men of marked ability, and the subassistant surgeons, a class which we had created, had done much useful work, especially when under British supervision. But India had never shown the aptitude for Western medical science which had distinguished Japan. The ways of Western medical science had not yet won the full confidence of the Indian people, or even of all the educated classes, although Mr. Gandhi, who was the greatest protagonist of Indian methods, was not anxious to be operated on by an Indian surgeon. Vaids and Hakims were still numerous and influential, and they accounted annually for a considerable part of the mortality in India. The Ayurvedic and Unani systems, which were not really systems, were now being subsidised from public funds in some places, and this waste of public money was sure to be increased in the future. If the I.M.S. was not restored there would be a large reversion to indigenous methods, which would have a disastrous effect on the general health in India, and there would also be widespread corruption. India could not at present produce men capable of directing, teaching, and developing an exotic system of medicine and surgery, and besides that caste laws might, and very often did, interfere with the work of the Indian practitioner. Of the very large number of students turned out annually from our medical schools a considerable proportion never made any attempt to practise and many of them became politicians, while a few had specialised in bombs. So far as British men, women, and children in India were concerned they must all feel that it was the duty of the Government to provide them with medical assistance from men of their own race. The Lee Commission admitted this, and proposed to set up districts each possessing a European officer supported in whole or in part at the public expense. If the districts were made small enough this plan might work, but already in some cases great hardship existed through the great distances which separated British people in India from a British doctor. He did not forget the work of the medical missions, of which he saw a great deal. They also were bringing Western science to the people of India, and perhaps especially to the women of India who were in dire need of it. The difficulties in finding a solution of many of the present problems were very great in view of the hostility towards British officials, British methods, and British science, which had been generated in recent years. He disliked and distrusted centralisation, but he was convinced that the general control of any civil medical service in India, of medical education, and of medical research must be retained in the hands of the Imperial Government. Failing this there would certainly be a general reaction and a fatal lowering of standards in the whole administration of the medical services throughout India.

The EARL of BIRKENHEAD (Secretary of State for India) said that the Indian Medical Service and its organisation had always been a question of extreme difficulty. It was at once a military and a civil medical service, and the interests of the two branches had not always been the same. The cardinal fact was that, generally speaking, the civil medical administration of India in the provinces, including the administration of hospitals, public health, and the provision for medical education, was a Provincial Transferred Subject under the Act of 1919, and the Secretary of State had divested himself of the powers of superintendence and control which he formerly exercised with regard to it. The Lee Commission, subject to certain limitations, took the same line with the Indian Medical Service as with the other all-India services dealing with transferred subjects. It appeared to them to be the logical and practical sequence of the reforms that, subject to the reservation of the rights of present members of the service, the provincial governments should in future recruit and control the services for whose work they were responsible to the Provincial Legislatures. In the case of the Indian Medical Service, however, the general principle was limited by two important considerations: first, the Civil Medical Service was the only source from which a medical reserve for the needs of the army, and in particular its requirements in trained British medical men, could be easily obtained in emergency; secondly, he had decided to adopt the recommendations of the Lee Commission for the provision for European services of medical attendance by British medical men. In the light of what he had said it would be clear that the Secretary of State would no longer undertake to recruit officers for the medical administration in

India generally or, in particular, for civil hospitals as such. Nor could he assume responsibility for the medical care of British non-officials resident in India. But the Act left as "Central Subjects," for which the Government of India were responsible, a number of matters, for instance, central agencies for research and technical training and the promotion of special studies, and a reserved responsibility in regard to legislation for infectious diseases and the regulation of medical qualifications and standards. For these the Secretary of State remained responsible, and he would continue to recruit officers to deal with them. He would also, of course, recruit for the civil medical needs of administrations that remained directly under the Government of India and for the Political Department. There remained for consideration the provisions to be made (1) for the army, including its medical reserve, and (2) for medical attendance on the European services as recommended by the Lee Commission. He had received the recommendations of the Government of India on these matters, and their consideration was already well advanced in his department. He was not yet in a position to communicate his final decisions, but he might, perhaps, indicate the lines on which he thought a solution of this difficult question would be found. The Lee Commission, with some hesitation, for they realised that military organisation lay outside their terms of reference, recommended that the military side of the Indian Medical Service should be absorbed in the Royal Army Medical Corps. The proposal had received very careful consideration from the Government of India and himself, and they had come to the conclusion that the solution proposed would raise many more difficulties on the military side than it would solve. They, therefore, thought that the Indian Medical Service must be maintained. It would be essentially a military service, but its reserve would be secured by lending officers to the civil administration. A consideration of the numbers in question went to show that the number of European officers in the reserve so lent would be sufficient to provide for the needs of the European services on the lines of the scheme proposed by the Lee Commission. These officers would be stationed at the headquarters of groups of districts throughout India, and would be made available for the European services and their families. The officers required by the Government of India for the central medical subjects would also be obtained from the Military Indian Medical Service.

It was, of course, a matter of the first importance whether a service constituted on these lines would attract recruits of the right class. He was inclined to think that it would be essential, with this in view, to reserve for the portion of the army reserve lent to the civil side but not required directly for the medical care of the British services, a number of civil appointments; for instance, research or professorial appointments. Such appointments had always been one of the attractions of the Indian Medical Service, and if the essential army reserve maintained in civil employment allowed a margin, as it almost certainly would, it was clearly a gain not only from the point of view of recruiting inducements, but a gain to Indian public health generally that they should be employed in the departments of research and teaching in which their predecessors had done so much for the welfare of India. His statement was necessarily tentative, for the final conclusion could only be reached after a careful balancing of the various interests involved, and, in particular, the claims of the Local Governments to the control of the provincial medical administration. But he was hopeful that a solution might be found on these lines, and that it would appeal to the medical profession. He was the more optimistic on the last point because, unlike certain other services, the Indian Medical Service was at present obtaining recruits of a high standard from the medical profession in this country, notwithstanding the uncertainty of the position pending his decision.

HOUSE OF COMMONS.

WEDNESDAY, JULY 29TH.

Appointment of Medical Service Chairmen.

Mr. MELLER asked the Minister of Health (1) what was the present procedure for appointing the chairmen of the medical service, the pharmaceutical service, and the joint services subcommittees of an insurance committee; whether such procedure had worked effectively since the inception of the National Health Insurance Act; and whether he had received any request from an insurance committee for amending the present regulations; and (2) whether he had received from the insurance committee for the County of London a representation protesting against the National Health Insurance (Medical Benefit) Amendment Regulations (No. 2), 1925, which provided for the appointment of the chairman of the medical service subcommittee by the Minister of Health failing the unanimous vote of the subcommittee, and that such member might not be a member of the insurance committee; and what action he proposed to take.—Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) replied: Under the previous Regulations the chairman of the medical service subcommittee was required to be elected by the approved society representatives on the subcommittee and the medical practitioners appointed to be members of it, or in default of any selection by them by the neutral members of the insurance committee. No request for an amendment of the Regulations has been received from any insurance committee, but in London failure to find a chairman commanding the confidence of both parties led to the withdrawal of the medical representatives and the machinery for the investigation of complaints was brought to a standstill. A similar situation has arisen recently in Southampton. The amending regulations of July, 1925, arose out of the difficulty in London, and represented a settlement which my right hon. friend understood to be acceptable to both parties to the dispute. My right hon. friend has recently received representations from the London Insurance Committee against the new regulations, but he can see no other method of preventing the recurrence in future of a deadlock which is prejudicial to the administration of medical benefit and to the interests of insured persons.

THURSDAY, JULY 30TH.

Pensioners Medical History Précis.

Mr. HAYES asked the Minister of Pensions whether, in cases of appeal by a widow or orphan children of an ex-Service man whose medical history disclosed venereal disease, he would sanction the omission of all reference thereto from the précis sent to the widow or other appellant when such disease had no relationship to the cause of death.—Major G. C. TRYON replied: It has been the consistent policy of the Ministry, reinforced by repeated representations, to make a précis in a case of appeal a complete statement of the man's medical history as known to the Ministry, in order that the tribunal may have before it precisely the same and as full information as that on which the Ministry came to their decision. The Ministry are not in a position to determine the view which the tribunal may take as regards the connexion between the cause of death and any other disease of which there is evidence in the man's medical history. The case for presenting a complete statement to the tribunal is in my view so important that I could not authorise any exception to the rule.

Veterinary Inspection of Dairy Herds.

Mr. MACKENZIE LIVINGSTONE asked the Minister of Health what local authorities now carried out veterinary inspection of dairy herds.—Mr. NEVILLE CHAMBERLAIN replied: A few of the sanitary authorities in England and Wales systematically carry out veterinary inspections of dairy herds, and I believe that most sanitary authorities have made arrangements for obtaining the services of a veterinary surgeon for the inspection of cattle where occasion demands.

Industrial Hygiene.

Colonel WOODCOCK asked the Minister of Labour whether any effect had been given to the unanimous resolution of the conference of the International Labour Organisation, Washington, 1919, that an advisory committee on which the governments, the employers, and the workers should all be represented, should be appointed without delay to keep in touch with the work of the health section of the International Labour Organisation.—Mr. BETTERTON (Parliamentary Secretary to the Ministry of Labour) replied: So far as I have been able to ascertain up to the present the only committee appointed as a result of the Washington resolution to which my hon. and gallant friend refers is the Correspondence Committee on Industrial Hygiene. That Committee, however, consists of experts and not as laid down by the Washington resolution of representatives of governments, employers, and workers.

TUESDAY, AUGUST 4TH.

Deaths from Small-pox.

Mr. BROAD asked the Minister of Health whether the Registrar-General would revise his figures for 1924 in regard to small-pox deaths, in the light of the information given in the recent Report of Sir George Newman, in which five of the small-pox deaths were transferred to other classifications, it being the opinion of the certifying doctor that small-pox was not the cause of death.—Mr. NEVILLE CHAMBERLAIN replied: I understand that in the case of all the deaths in question small-pox is certified by the certifying doctor as being one of the causes of death. In such cases the selection from among several certified causes of the particular cause under which the death is classified for statistical purposes is governed by general rules, based upon international agreement, which in this country provide that deaths should be classed to small-pox if this disease is included among the certified causes. I see no reason for revising the classification in the case of these particular deaths, especially since full information regarding them is already given in the chief medical officer's report.

Medical News.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—An ordinary quarterly Comitia of the College was held on July 30th, the President, Sir Humphry Rolleston, being in the chair. The minutes of the Censor's Board were read. The following successful candidates were admitted as Members:—

Drs. Henry K. Bates, Robert H. Baxter, John Brander, Edward A. Carmichael, Peter Connan, John H. Dunn, Edward Gallop, Humphry H. Gleave, Frank D. Howitt, Redvers N. Ironside, Victor J. F. Lack, Reginald C. Lightwood, James L. Livingstone, Neville L. Lloyd, George L. Lyon-Smith, Bruce Maclean, Cyril C. W. Maguire, Frederick H. Moran, Bernard E. Schlesinger, John S. Sloper, Harry L. Stokes, Robert Y. Stones, Samson Wright, and Harry W. Wunderly.

The following College officers, members of committees, and examiners were elected for the ensuing year:—

Censors.—Sir John Rose Bradford, Dr. Cyril Ogle, Dr. James Calvert, and Dr. Robert Hutchison.
Emeritus Treasurer.—Sir Dyce Duckworth.
Treasurer.—Dr. Sidney P. Phillips.
Registrar.—Dr. Raymond Crawfurd.
Harveian Librarian.—Dr. T. H. Arnold Chaplin.
Members of the Library Committee.—Dr. Frederick Parkes Weber, Dr. Herbert Spencer, Dr. William C. Bosanquet, and Dr. Charles J. Singer.
Curators of the Museum.—Dr. John Mitchell Bruce, Sir Seymour John Sharkey, Sir Frederick W. Andrewes, and Dr. William Hunter.
Finance Committee.—Dr. Arthur George Phear, Dr. John Fawcett, and Dr. Frederick J. Poynton.
Examiners.—Chemistry: Dr. Robert H. A. Plimmer and Dr. William H. Hurtley. Physics: Dr. William E. Curtis and Dr. Sidney Russ. Practical Pharmacy: Dr. Edward A. Cockayne, Dr. Nathan Mutch, Dr. Alfred J. Clark, Dr. Hugh Gainsborough, and Dr. Orlando Inchley. Physiology: Dr. John B. Leathes and Dr. John Mellanby. Anatomy: Dr. G. Elliot Smith. Medical Anatomy and Principles and Practice of Medicine: Dr. H. Morley Fletcher, Dr. Arthur G. Phear, Dr. William C. Bosanquet, Dr. James W. Russell, Dr. Charles R. Box, Sir James Purves-Stewart, Dr. Lewis A. Smith, Sir John C. Briscoe, Dr. Charles E. Lakin, and Dr. James A. Torrens. Midwifery and Diseases peculiar to Women: Dr. Cuthbert H. J. Lockyer, Sir Ewen J. Maclean, Sir Henry J. F. Simson, Dr. William Gilliatt, and Dr. Stanley Dodd.
Examiners in Public Health.—Part I.: Mr. John H. Ryffel. Part II.: Dr. David S. Davies.
Tropical Medicine.—Sir Percy W. Bassett-Smith (Bacteriology); Sir Leonard Rogers (Diseases and Hygiene of the Tropics).
Ophthalmic Medicine and Surgery.—Dr. James S. Collier.
Psychological Medicine.—Part I.: Dr. Eric D. Macnamara. Part II.: Dr. Robert P. Smith and Dr. C. M. Hinds Howell.
Laryngology and Otology.—Sir StClair Thomson.

Licences to practise Physic were granted to the following candidates, who have passed the Final Examination of the Conjoint Board, and are now entitled to receive the conjoint diploma:—

Ahmed K. Abdel-Khalik, Cairo; Geoffrey N. M. Aitkens, Charing Cross; John S. Aldridge, St. Bart.'s; David R. Allison, Leeds; Roland G. Anderson, St. Bart.'s; Colin B. Andreae, Guy's; Reginald Armsden, Univ. Coll.; Humphrey M. H. Ashwin, Sheffield and Guy's; Edward A. Aslett, St. Mary's; George S. Aston, Birmingham; Harold Awrounin, Charing Cross; Herbert M. Ayres, St. Thomas's; Edward Bacon and Harold I. C. Balfour, St. Bart.'s; Douglas E. Barton, St. Mary's; George F. G. Batchelor, St. Andrews; Ralph M. Bates, London; •Sybil K. Batley, Royal Free; Cyril E. Beare, Middlesex; John G. Y. Bell, King's Coll.; Stanley A. Belshaw, Cambridge and Middlesex; •Jane G. Bevan, Westminster; Suryasen N. Bhansali, Bombay; Shankar S. Bhatnagar, Punjab and Middlesex; Charles A. Birch, Liverpool; Hugh M. Birch, Adelaide and London; Frank H. Blackburn, Durham; Norman W. Bolton, Manchester; •Edith D. Bowie, King's Coll.; Harry C. Boyde, St. Bart.'s; Clarence S. Broadbent, Oxford and Leeds; •Theodora Brookes, Royal Free; Abraham S. S. Brown, Cape and Liverpool; James A. S. Brown, Cambridge and London; James L. Brown, King's Coll.; Thomas E. Brown, Cape and St. Thomas's; Oglethorpe W. B. Browning, Univ. Coll.; Harold H. Bullough, Manchester; •Eleanor G. Burdett, Royal Free and St. Mary's; Richard C.L. Burges, Cambridge and Birmingham; Thomas J. Burke, Charing Cross and Cardiff; John W. D. Buttery, Cambridge and St. Bart.'s; •Avie R. H. Cama, Bombay and Royal Free; Frederick F. R. Carreck, St. Mary's; Ferdinand Carroll, Madras and St. Mary's; John H. T. Challis, London; •Irene E. Chandler, King's Coll.; •Gwendolen S. Chataway, Royal Free and St. Mary's; •Eileen A. Chennell, St. Mary's; •Ella J. Cockram, Oxford and King's Coll.; •Marian B. Coleman, Royal Free; Arthur C. Copley, Cambridge and Guy's; •Celia M. M. Culver-Evans, Royal Free; •Evelyn J. Curtis, King's Coll.; George W. Curtis, Birmingham; Robert S. Davidson, Manchester; Alfred Davies, Cardiff and Middlesex; Cyril I. Davies, London; Harry G. Davies and Llewellyn Davies, Guy's; Vincent H. G. Davies, Cardiff and Middlesex; George H. Day, St. Bart.'s; •Doris L. Delittle, Westminster; Norman A. Dickinson, Manchester; Frederick R. Dingle, Guy's; Charles Donald, Aberdeen; Lawrence Earlam, Liverpool; Robert G. Eastwood, Leeds; Richard W. Edwards, Cardiff and Guy's; Abd el Kader H. El Shurbagi, Cairo and St. Thomas's; Horace Evans, London; Ivor Evans, Cambridge and St. Thomas's; Thomas F. Everett, Cambridge and Middlesex; Harold E. Filmer, Guy's; Marcus Fine, Cape and London; John W. Fisher, St. Mary's; Maurice Fishman, St. Bart.'s; Arthur H. W. Fleming, Manchester and Middlesex; •Elsie C. I. Focke, Royal Free; Ambrose J. Foote, Oxford and London; Ernest A. Freeman, St. Bart.'s; Leslie O. F. Fysh, Oxford and London; Joel Gabe, Westminster; Wilfrid F. Gaisford, St. Bart.'s; Eric A. Gerrard, Manchester; •Winefride M. Gibson, Charing Cross; Reuben Glasser, Cape and Liverpool; Aaron Glatt, Liverpool; Eric H. Glynn, Cambridge and Liverpool; Thomas R. Goddard, Univ. Coll.; Joseph Goldberg, Cape and London; Walter L. Gopsill, St. Thomas's; James Gore, Birmingham; •Edith L. Gould, Royal Free; •Gladys Gounent, Royal Free and St. Mary's; Sydney J. P. Gray, Cambridge and St. Bart.'s; Howard L. H. H. Green, Cambridge and London; •Emily M. Hall, St. Mary's; George T. Hankey, Guy's; Maurice J. Harker, Cambridge and St. Bart.'s; Cecil G. Harper, Middlesex; •Helen M. Harris, Royal Free; •Constance E. Harrison, London; Leslie F. A. Harrison, St. Bart.'s; John W. Hart, Univ. Coll.; Farid Y. Hasaballa, Cairo and St. Thomas's; William D. Hasler, Middlesex; Benjamin E. Hawkins, Guy's; John C. Heal, Liverpool; •Lynette Hemmant, Cambridge and King's Coll.; •Dorothy G. Hervey, Birmingham; •Kathleen L. Hicks, Univ. Coll. and St. Mary's; Charles H. Highfield, Guy's; Gerald S. Hirst, Leeds; Chee H. Ho, St. Thomas's; Bernulf L. Hodge, St. Bart.'s; Simon J. Hoffman, Cape and Middlesex; Richard St. J. Honner, Sydney and London; Charles L. Hunt, St. Bart.'s; David J. C. Hutton, Middlesex; Stuart W. Innes-Smith, Edinburgh and Sheffield; Adangaprathoo O. Jacob, Madras; Trevor L. Jenkins, Cardiff and Middlesex; Emrys Jones, Guy's; •Helen V. Jones, Cardiff; and St. Mary's; Iorwerth H. Jones, Charing Cross; •Morfydd R. Jones, Royal Free; Thomas S. L. Jones, Liverpool; George W. Keele, Univ. Coll.; John J. Keevil, Cambridge and St. Thomas's; •Frances M. Kenyon, King's Coll.; Arthur K. Kerr, St. Bart.'s; Bernard Kornblum, Warsaw and Guy's; Otto F. A. Krause, Guy's; Edgar D. Lawrence, St. George's; Henry E. Lewis, Guy's; William E. Lishman, Liverpool; •Dorothy M. Llewellin, Westminster; Thomas R. E. Longton, Liverpool; Edmund S. S. Lucas, St. Thomas's; William S. Macgowan, Middlesex; Colin C. Mackinnon, Middlesex and Bristol; •Aileen I. McMahon, Charing Cross; Ian McPherson, Middlesex; Malcolm L. Maley, St. Bart.'s; •Joan G. Malleson, Charing Cross; Wilfrid N. Maple, St. Thomas's; Hugh L. Marriott, Middlesex; Colin H. Mason, Calcutta and St. Mary's; Alexander K. Miller and Nathaniel A. Miller, St. Thomas's; Hugh P. F. Modder, Ceylon and St. George's; William J. Moody, Cambridge and London; Arthur L. Moorby, King's Coll.; Reginald H. Mortis, Charing Cross; Kavasseri V. N. Nair, Madras and London; William B. Norcott, Guy's; •Kathleen G. Norton, Oxford and St. Mary's; Bryan V. O'Connor, Oxford and Middlesex; •Gwynedd M. E. Olive, Royal Free; •Edith G. Peacock, Charing Cross; Robert W. L. Pearson, Cambridge and Liverpool; Harry Peaston, Liverpool; Kudatelgé R. T. Peiris, Ceylon and King's Coll.; Alfred B. Plant, Guy's; William G. Platt, Leeds; George L. S. Plumbly, Univ. Coll.; Stephen M. Power, London; Isaac Price and •Nora Proctor-Sims, King's Coll.; Trefor B. Prys-Jones, Cardiff and Middlesex; •Violet R. H. Rains, King's Coll.; Jacob Raisman, Leeds; James R. Ratcliffe, Guy's; Mysore P. S. Rau, Madras and Middlesex; John E. Readman, Manchester and London; Eric W. Riches, Middlesex; James B. W. Robertson, Cambridge and St. Bart.'s; •May E. Rogers, Royal Free; James C. Ross, Liverpool; George L. F. Rowell, Cambridge and St. Bart.'s; Enrique A. Rucker, Middlesex; Hubert Scudamore, Cambridge and London; Adolph Sebba, London; Herbert J. Seddon, St. Bart.'s; Stewart Q. Servanté, Middlesex; Joseph Shepherd, Univ. Coll.; Jonathan Shutt, Leeds and London; •Amelia M. Simmons, Charing Cross; John H. Simmons, King's Coll.; John A. Simons, Guy's; Alexander Simpson-Smith, Cambridge and Guy's; Eric G. Smallbone, Guy's; •Rachel M. S. Smellie, St. Mary's; Reginald H. Smith, Manchester; Richard K. Smith, St. Bart.'s; Simon Speck, Middlesex; Leopold P. Spero, St. Mary's; •Lois Stent, Manchester; Thomas W. Stephens, Cape and St. Thomas's; James M. Stobo, Glasgow and London; Richard Stuart, St. Bart.'s; Frederick W. Ta'Bois, London; Alan C. Taylor, Guy's; Geoffrey F. Taylor, King's Coll.; William A. Taylor, London; •Josephine I. Terry, St. Mary's; Daniel E. Thomas, Cardiff and St. Bart.'s; John E. Thomas, Cardiff; John L. Thomas, Cardiff and Middlesex; Frank S. Thornton, St. Thomas's; Frederick T. Thorpe, Birmingham; Oscar C. Tobin, London; Harold Trafford, Guy's; •Beatrice E. Turner, Royal Free; Kavas A. Turner, Bombay and Leeds; Leo G. W. Urich, Middlesex; Johannes N. J. L. Uys, Cape and St. Thomas's; Philip R. Viviers, Cape and St. Bart.'s; Arthur G. Walter, Cambridge and St. Thomas's; •Elizabeth M. Whishaw, St. Mary's; Ivor E. Whitehall, Univ. Coll.; John S. Whitton, St. Bart.'s; John M. Wilder, London; Edward C. P. Williams, Middlesex; •Ellis J. Williams, Cardiff; Gwilym O. Williams, Cardiff and Liverpool; Herbert J. Williams, Birmingham; John H. Williams, London; William B. Williams, Charing Cross and Cardiff; John H. Willis, London; Norman Wilson, Univ. Coll.; Richard E. Wolfendale, Manchester; Clarence J. Wylde, Bombay and Guy's; Robert H. Yelf, King's Coll.; and Thomas Yoxall, Birmingham.

• Under the Medical Act, 1876.

The undermentioned diplomas were granted, jointly with the Royal College of Surgeons of England, to the following successful candidates:—

Diploma in Public Health.—Charles O. S. B. Brooke, Dorothy M. Campbell-Meiklejohn, John V. Carroll, Joseph Cauchi, Edward T. P. Eames, David G. M. Edwards, John C. N. Harris, Strafford S. Hewitt, Alice E. D. Karn, Burjor F. Khambatta, Chandu V. Ramchandani, Bisheshwar P. Srivastava, Doris M. Stone, and Frederick Tooth.

Diploma in Tropical Medicine and Hygiene.—Ahmed F. Abbassi, Mohamed Ali, Donald D. Anderson, John B. S. Baxter, John C. R. Buchanan, Matthew Burn, Angus H. Campbell, Robert A. Chambers, William Corner, John R. Davies, Gilbert H. Dive, Ibrahim Girgis, Francis M. Halley, Hans-Raj, George W. Harley, Alan McKenzie, Mir S. Mahmood, William J. Moir, Charles R. Philip, Louis M. J. R. Pilot, Sundramier Ramakrishnan, Hugh D. C. Rice, George W. Scott, Edward A. Seagar, Timothy F. Sheehan, Charlotte A. Stuart, Clement Sturton, and W. Wilkinson.

Diploma in Psychological Medicine.—Geoffrey T. Baker, George L. Cutts, Henry T. Jones, John J. Laws, John B. S. Lewis, Hugh C. McManus, Andrew H. Pearce, Gordon F. Peters, Reginald G. Riches, Gerald R. A. de Montjoie Rudolf, and John Russell.

Diploma in Ophthalmic Medicine and Surgery.—Edward W. Arndt, Harnand L. Batra, Kashinath D. Bhave, Catharine Boyd, Martin M. Cruickshank, Arthur W. D'Ombrain, Agnes Estcourt-Oswald, James A. F. Flynn, Kenneth B. Johnston, Wajid Ali Khan, Coimbatore V. Krishnaswami, Arthur P. Lawrence, Arthur L. McCurry, William M. C. MacDonald, Kizhakkekalattil K. Nayar, Kaikhushru B. Palkhivala, and Reuben W. Payne.

Diploma in Laryngology and Otology.—Sek Nin Chau, Edward D. D. Dickson, Robert McM. Glynn, Ronald E. Jowett, Jean P. Kies, Norman W. MacKeith, and John H. Shaw.

By-law 112, relating to the age of candidates for the Membership, was altered to read as follows: "Every candidate for the Membership shall furnish proof of having attained the age of 23 years."

The Baly Medal was awarded to Prof. R. Magnus, of Utrecht, on the recommendation of Council.—The President announced that he had appointed Sir John Rose Bradford to deliver the Harveian Oration in 1926.—A report was received from the Representative of the College on the General Medical Council concerning the proceedings of the Council at their session held in May and June last.—A report was received, dated May 29th, 1925, from Dr. Gordon Holmes, Representative of the College at the Charcot Centenary in Paris.—A report was received from Sir Percival Horton-Smith Hartley, Representative of the College at the Eleventh Conference of the National Association for the Prevention of Tuberculosis on July 6th and 7th.—A report was received from Dr. Dawtrey Drewitt, the Representative of the College on the Chelsea Physic Garden.—Sir Frederick Andrewes was reappointed a Representative on the Executive Committee of the Imperial Cancer Research Fund.—A report was received from the Committee appointed to revise the by-laws and regulations relating to the examination for the Membership.—After some further College business of formal nature, the President dissolved the Comitia.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At a meeting of the Council of the College on July 30th, Sir John Bland-Sutton, the President, in the chair, Prof. Alexander Primrose was admitted a Fellow of the College, Mr. Evelyn Sprawson was re-elected a Member of the Board of Examiners in Dental Surgery, and Sir D'Arcy Power was re-elected a Member of the Executive Committee of the Imperial Cancer Research Fund.—The terms of a petition for a supplemental charter were taken into consideration and approved, and it was decided that the further steps to be taken in the matter should be considered at the quarterly meeting of the Council in October. The proposed supplemental charter is, in general terms, to enable the Council to make improved arrangements for certain examinations. In accordance with this subject it is proposed to give the Council power to increase the number of members of the Court of Examiners and to give greater freedom in the selection of examiners for the Licence in Dental Surgery. It is also proposed to admit women Fellows and Members of the College and Licentiates in Dental Surgery on the same terms and conditions as men and with the same rights and privileges and to effect certain minor adjustments.—The diploma of Fellow was conferred upon the following three candidates who have now complied with the necessary by-laws: Drs. John P. Hosford, Alec A. Lees, and Donald E. Ross.

SOCIETY OF APOTHECARIES OF LONDON.—At examinations held recently the following candidates passed in the undermentioned subjects:—

Surgery.—S. J. Alexander, Sydney and St. George's Hosp.; S. Bartlett, Liverpool; F. Beinaschewitsch, Berne; F. Carroll, St. Mary's Hosp.; W. Hinds, Durham; and P. H. Knowles, Bristol.

Medicine.—S. Bartlett, Liverpool; F. T. Birkinshaw, Univ. Coll. Hosp.; A. H. Henson, Charing Cross Hosp.; A. Kaplan, St. Mary's Hosp.; T. A. Lazaro, St. Bart.'s Hosp.; C. H. Mason and C. S. Netscher, St. Mary's Hosp.; R. C. Pratt, Birmingham; and K. E. R. Robertson, St. Mary's Hosp.

Forensic Medicine.—S. Bartlett, Liverpool; T. A. Lazaro, St. Bart.'s Hosp.; R. D. Mason, St. Mary's Hosp.; P. B. P. Mellows, St. Bart.'s Hosp.; J. M. Moran, Manchester; and K. E. R. Robertson, St. Mary's Hosp.

Midwifery.—S. Bartlett, Liverpool; S. A. Joelson, London Hosp.; C. H. St. Johnston, Birmingham; J. Mindess, London Hosp.; J. M. Moran, Manchester; and P. H. Row, London Hosp.

The Diploma of the Society was granted to the following candidates entitling them to practise medicine, surgery, and midwifery: S. J. Alexander, S. Bartlett, F. T. Birkinshaw, F. Carroll, A. Kaplan, P. H. Knowles, C. H. Mason, C. S. Netscher, and K. E. R. Robertson.

THE Royal Free Hospital has received a gift of £2000 from an anonymous donor for the enlargement of its light treatment department.

KING'S COLLEGE HOSPITAL.—In 1922 the scholars and staff of the Mary Datchelor girls' school at Camberwell raised £650 in connexion with the London Schools' Hospital Fund towards the £1000 required for the endowment of a bed in King's College Hospital. The fund has now been completed and last week the Bishop of Kingston dedicated the bed. In 1912 the old girls endowed a cot at the hospital.

ROYAL COMMISSION ON NATIONAL HEALTH INSURANCE.—The Commission, having held 40 meetings at weekly or shorter intervals since October last for the hearing of oral evidence, have now adjourned until October next, when the final evidence from representatives of the Government departments will be taken, after which the Commission will proceed to consider their report. Proof copies of the oral evidence and the relative statements submitted at the meetings of June 25th (3*s.*) and 30th, and July 2nd and 7th (each 2*s.* 3*d.*), as well as Volume II. of the Minutes of Evidence, covering the period from Jan. 15th to March 26th (12*s.* 6*d.*), are on sale at H.M. Stationery Office.

TUBERCULOSIS IN WALES.—The Board of Governors of King Edward VII. Welsh National Memorial Association for the Prevention, Treatment, and Abolition of Tuberculosis met for the first time since its formation in 1912 for its annual meeting at Bangor on July 30th. The President stated in his opening address that English local authorities were being treated more generously than the Welsh Association. The Association had provided 1400 beds at an average cost of £322 per bed, including the cost of X ray installations, operating theatres, and other necessaries. Treasury grants had not amounted to more than £166 per bed, while the Corporation of Manchester for its tuberculosis scheme would receive, he said, grants at the rate of £525 from the Treasury. The annual statistics of the work of the Association during the past year showed that the number of people examined at the dispensaries and visiting stations was not quite so large as in the preceding year. During last year in hospitals or sanatoriums, 4480 patients were treated. The Association now had 1400 beds in their own institutions. In 1911 there were 3663 deaths from tuberculosis in Wales and Monmouth, and in 1924 the number was 3189, while the population in that period had increased by 300,000—i.e., for every million persons living in Wales and Monmouth in 1911 there were 1513 deaths from tuberculosis, while in 1924 the deaths per 1,000,000 numbered 1169. In the five westernmost counties—Pembrokeshire, Cardiganshire, Merionethshire, Carnarvonshire, and Anglesey—the death-rate per 1,000,000 persons in 1924 was 1664. In the other eight counties the rate was 986. The need for more beds, particularly for persons suffering from surgical tuberculosis, was strongly emphasised. Mr. J. C. Townley emphasised the incidence of tuberculosis in the three western counties, Merioneth, Cardiganshire, and Carnarvon. The contrast in the death-rates from tuberculosis was most marked between the eastern and western counties and even between the east and west districts of the counties themselves. In Carnarvon the deaths from tuberculosis ranged from 6 per 10,000 in Conway rural area to 28 in Gwyrfai and 26 in Glasfryn. In the part of Montgomeryshire which bordered Merioneth the rate was 6, while in the adjoining rural area of Dolgelly in Merioneth it was 14, and farther west it was 19. Colonel Lyle Cummins, the principal medical officer of the Association, said one satisfactory feature in relation to the three counties was that, while their mortality from tuberculosis started higher than other counties, the decline in the death-rate had been as pronounced as in the remainder. Several theories had been propounded to account for the greater susceptibility of the western counties to tuberculosis,

including the prevalence of rain-bearing winds, especially westerly winds. Another suggestion was that people living in isolated districts had a lesser power of resistance than those living in congested town areas, where they became more immune from attack and their resisting powers increased.

DUBLIN: POST-GRADUATE CLASSES.—Arrangements have been made, with the approval of the Board of Trinity College, for a post-graduate course of instruction at the School of Physic during the autumn from Monday, Sept. 14th, to Saturday, Oct. 3rd. Members of the class can reside in college rooms and dine on commons.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—Queen Mary's Hospital will hold a general course in Medicine, Surgery, and the Special Departments from August 24th to Sept. 5th. Daily sessions will be held from 10.30 A.M. to 5 P.M., including demonstrations of clinical methods, groups of illustrative cases, &c. A special feature of the course will be the opportunity for practical study in gynæcology and obstetrics.—A variety of special courses will be held during the month of September. From the 7th, continuing for five weeks, will be given an Operative Surgery course arranged by the Seamen's Hospital, the meetings taking place four times weekly.—On Sept. 21st the Brompton Hospital begins a two weeks' course dealing with Pulmonary Diseases from all aspects.—There will be an afternoon course with evening V.D. clinics at the Blackfriars Skin Hospital from Sept. 7th to 19th.—The same date has been chosen for a course to take place at the Infants Hospital. A special feature of this is the instruction available in all the latest methods employed for dealing with infant ailments, and facilities are provided for visits to centres away from the hospital.—The Royal Westminster Ophthalmic Hospital has fixed a course from Sept. 7th to 26th, consisting of instruction in the out-patient department and special lectures and demonstrations dealing with Diseases of the Eye.—There will be an intensive course in General Medicine, Surgery, and the Specialties at the Westminster Hospital from Sept. 21st to Oct. 3rd.—Dr. C. B. Heald has undertaken a series of lecture-demonstrations in Electro-therapy, on Wednesdays, beginning Sept. 23rd, at the Royal Free Hospital.—Copies of the syllabus of each of the aforementioned courses, together with the general programme of the Fellowship of Medicine, can be obtained from the Secretary to the Fellowship at 1, Wimpole-street, London, W. 1.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, August 10th, to SATURDAY, August 15th.—PRINCE OF WALES'S HOSPITAL, Tottenham, N. (N.E. London Post-Graduate College). Intensive Course in General Medicine, Surgery, and the Special Departments. Sessions 10.30 A.M. to 5.30 P.M., except Saturday (second week).—ALL SAINTS HOSPITAL, Vauxhall Bridge-road, S.W. Special Course in Urology, consisting of clinical instruction and special lecture on subject.—WEST END HOSPITAL FOR NERVOUS DISEASES, 73, Welbeck-street. Lecture-demonstrations illustrated by cases at 5 P.M. Monday, Dr. L. R. Yealland on The Varieties of Muscular Atrophy. Tuesday, Dr. Hildred Carlill on The Reflexes in Health and Disease. Wednesday, Mr. C. Wakeley, on Cerebral Surgery. Thursday, Dr. E. D. Macnamara on The Sequelæ of Encephalitis Lethargica. Friday, Dr. C. Worster-Drought on Diagnosis and Treatment of Syphilis of the Nervous System.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, August 10th.—11 A.M., Surgical Registrar: Surgical Wards. 2 P.M., Dr. Scott Pinchin: Medical Out-patients. 3 P.M., Dr. Saunders: Medical Wards.
TUESDAY.—11 A.M., Dr. McDougal: Electrical Dept. 11 A.M., Mr. Endean: Venereal Diseases. 2 P.M., Dr. Burrell: Chest Cases.
WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 2 P.M., Dr. Dowling: Skin Dept. 2 P.M., Mr. Gibb: Eye Dept.
THURSDAY.—11 A.M., Sir Henry Simson: Gynæcological Wards. 12 noon, Surgical Registrar: Surgical Pathology.
FRIDAY.—2 P.M., Dr. Burrell: Medical Out-patients. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2 P.M., Mr. Vlasto: Throat, Nose, and Ear Dept.
SATURDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children.
Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

Appointments.

BUSH, W. H., L.M.S.S.A., L.S.A., has been appointed Certifying Surgeon under the Factory and Workshop Acts for Chulmleigh, Devon.
DONNELLY, N. M., M.B., B.Ch. R.U.I., D.P.H., Assistant Medical Officer and Tuberculosis Officer for Deptford.
MOXON, F., M.B., B.S. Durh., Ophthalmic Surgeon, The Nelson Hospital, Merton.
TURNER, EILEEN M., M.B., B.S. Lond., Assistant Medical Officer of Health and Assistant School Medical Officer, Holland, Lincs.
Manchester Royal Infirmary: SMIRK, F. H., M.B., Ch.B., MARSHALL, C. T., M.B., Ch.B., YOUNG, N., M.B., Ch.B., and MUCKLOW, S. L., M.B., Ch.B., House Physicians; LANGFORD, C. F., M.B., Ch.B., BOLTON, N. W., M.B., Ch.B., BOOTH, G. H. H., M.B., Ch.B., WOOD, R., M.B., Ch.B., and SEED, N. F., M.B., Ch.B., House Surgeons; PENMAN, H., M.B., Ch.B., House Surgeon to Special Department; MUMFORD, P. B., M.B., Ch.B., Assistant in the Dermatological Department; and JOHNSON, M., M.B., Ch.B., Surgical Clinical Assistant.

Vacancies.

For further information refer to the advertisement columns.

Birkenhead Borough Hospital.—Third H.S. £100.
Bristol, Cossham Memorial Hospital, Kingswood.—Res. M.O. £150.
Carlisle, Cumberland Infirmary.—H.P., &c., at rate of £155. Also Jun. H.S. at rate of £135.
Derby, Royal Derby and Derbyshire Nursing and Sanitary Association.—Hon. Obstet. P.
Derbyshire County Council.—Asst. Sch. M.O. and Tub. O. £650.
Jersey General Hospital and Poor-law Infirmary.—Res. M.O. £200.
Liverpool County Borough.—Jun. Asst. Sch. M.O. £600.
Manchester and Salford Hospital for Skin Diseases.—H.S. £100.
Newcastle-upon-Tyne, Princess Mary Maternity Hospital.—Asst. Res. M.O. at rate of £40.
Plymouth Borough.—Asst. M.O.H. £600.
Royal Free Hospital, Gray's Inn-road, W.C.—Cas. O. £150.
St. Bartholomew's Hospital.—Ophthalmic S. and Phys.-Accoucheur.
St. Peter's Hospital for Stone, &c., Henrietta-street, Covent Garden, W.C.—H.S. at rate of £75.
Sudan Government, Wellcome Tropical Research Labs., Khartoum.—Asst. Bacteriologist. £720.
Sunderland Royal Infirmary.—H.P. £140.
Sunderland Royal Infirmary and Children's Hospital.—Hon. S. for Ear, Nose, and Throat.
Warrington Infirmary and Dispensary.—Jun. H.S. £175.
West End Hospital for Nervous Diseases, Gloucester Gate, Regent's Park, N.W.—Sen. H.P. at rate of £150.
West Riding County Council.—Dist. Tub. O. for Barnsley. £600.

The Chief Inspector of Factories, Home Office, London, S.W., announces a vacant appointment for a Certifying Factory Surgeon at Maesteg (Glam.).

The Secretary of State for the Home Department gives notice of a vacancy for a Medical Referee under the Workmen's Compensation Act, 1906, for the Districts of the Aberayron, Cardigan, &c. (Circuit No. 31). Applications should reach the Private Secretary, Home Office, not later than August 22nd.

Births, Marriages, and Deaths.

BIRTHS.

SATOW.—On July 26th, at "Ackland," Oxford, the wife of Lawrence L. Satow, M.C., M.R.C.S., of a son.

MARRIAGES.

HILL—VARLEY.—On July 28th, at the Congregational Church, St. Leonards-on-Sea, Humphrey Cheetham Hill, M.B., B.Ch., to Hilda Frances, fourth daughter of Rev. and Mrs. Henry Varley, of St. Leonards.
LODGE—CRESSWELL.—On July 27th, at the Parish Church of St. Mary the Virgin, Burley-in-Wharfedale, Samuel Durham Lodge, F.R.C.S., to Margaret Ianthe Edgar Alston, eldest daughter of Lionel Cresswell, J.P., Barrister-at-Law, and Mrs. Cresswell, of The Hall, Burley-in-Wharfedale.
POTTS—HEPWORTH.—On July 30th, at Brompton Parish Church, South Kensington, Dr. John Leonard Potts, to Nancy May, younger daughter of Mr. and Mrs. Allan Hepworth, of Ealing.

DEATHS.

BUNNY.—On July 23rd, Joseph Brice Bunny, L.R.C.P., M.R.C.S., of Victoria-park, Weston-super-Mare (formerly of Newbury), aged 78.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

PUBLIC HEALTH IN THE NEW HEBRIDES.

A DECLINING NATIVE POPULATION.

Mr. M. King, C.M.G., British Resident Commissioner, in his report for 1923, remarks that the New Hebrides, to which are attached the Banks and Torres Islands, have an area of about 5700 square miles. The natives are Melanesians, but in places there is a mixture of Polynesian blood. There is little change to be recorded in the numbers and composition of the non-native population of the group, the total of French nationality being 709 and of British 275. In regard to the gradual decrease in the native population, Mr. King thinks that of the many reasons assigned for it, those assigned by the late Dr. W H. R. Rivers, F.R.S., than whom none was more competent to speak, are the most worthy of consideration. He attributed the decline of the Melanesian population to this: "That the people have been deprived of nearly all that gives interest to their lives, and this loss of interest has been brought about by the unintelligent and indiscriminating action of Europeans towards native institutions." The Resident Commissioner proceeds: "I will not quote further, but would invite attention to the original essay in the work referred to ('Essay on the Depopulation of Melanesia,' Cambridge University Press, 1922). The lack of intelligence displayed by would-be civilisers in their action towards natives and native institutions has often impressed itself upon me. The action of such people appears never to be guided by consideration of the effects, positive or negative, good or ill, of such institutions on the native mind or character. The fact that the natives take interest in, and derive pleasure from, such or such an institution, seems sufficient to ensure its discouragement and ultimate suppression. To many of these institutions the natives have been strongly attached, and the blank in their lives left by their discontinuance or suppression is one that cannot be filled."

In most of the islands of the New Hebrides there is a great disproportion between the numbers of the two sexes, males in all cases predominating. Figures collected not long since by the Rev. M. Frater, of the Presbyterian Mission, relating to the population of two of the larger islands and of seven smaller ones, reveal disproportions ranging 5 to 30 per cent., the aggregate of males being 6508 and of females 5408. The general opinion for long was that this preponderance of males in northern islands is due chiefly to female infanticide, ill-treatment of female infants, the premature marriage of girls, and other preventable causes. Careful inquiry has, however, revealed the fact that, while the influences cited have a powerful effect, there is another and probably the chief one, and that is that the excess, as Mr. Frater writes, "begins at birth and is determined by prenatal causes. The male largely out-number the female births, and through the operation of the other causes the disparity between the sexes becomes more marked in adolescence and adult life." This may also be one of the non-contributory causes of the general decline of the native population. As opposed, however, to the experience of the northern islands, a census of the scanty native population of Efate and the adjacent small islands, also made, and very recently by Mr. Frater, revealed a distinct preponderance of females, but not to the same extent as noticed in the case of the males of the northern islands.

The Mission Hospital on Iririki (John G. Paton Memorial) continued its good work, as did the French Government Hospital in Vila. Unfortunately, the departure of the medical officer in charge necessitated the suspension of active operations by the first named before the end of the year. During the months it was open the number of in-patients was 482 (Europeans 17 and natives 465), and the out-patients numbered 902. At the French institution 870 in-patients were treated (Europeans 154 and natives 716), and out-patients to the number of 1965. The deaths in the British hospital numbered 33, 2 being Europeans, and in the French 42, 3 being Europeans. At the French hospital in the Canal de Segond (Santo) many natives benefited from the care of the Condominium medical officer. The Mission Hospital on the island of Tanna has been reopened and much good work has been done by Dr. Williams, the medical officer in charge. It is to be regretted that the arrangement made by the mission authorities was for a few months only. A complete hospital on the island of Ambrym was destroyed by the great volcanic eruption of 1913. The authorities of the mission fund which supported this institution have, it is learnt, decided to replace the destroyed building by another to be erected on the east coast of the island of Malekula. This project, if carried out, will supply a long-felt want, the destruction of the Ambrym institution having left the northern part of the group entirely unprovided in this respect. Influenza, fortunately not of the pneumonic type, and dysentery have claimed their usual toll of native victims.

A LIST OF SANATORIA.

THE Ministry of Health has issued a new list, 10(*b*), dated July, 1925, price 2*d*., enumerating the sanatoria and other residential institutions approved for the treatment of persons suffering from tuberculosis. This list, which takes the place of an earlier list, 10(*a*), dated April, 1923, applies to residents in England and Wales, and gives the names of the administrative counties and county boroughs in which the institutions are situated. The list distinguishes institutions where admission is restricted as regards class of disease and sex and gives in each case the date on which ministerial approval expires.

CLITORIDECTOMY IN OLD CALABAR.

IN a note on the custom of fattening up the girls of marriageable age among the Efik tribe at Old Calabar, Mr. L. W. G. Malcolm, in the August issue of *Man*, gives some particulars in regard to the operation of clitoridectomy, usually performed by the mother. The fattening-up process takes place at the age of puberty when the girl is secluded for from six months to two years, the period depending on the social position of the parents. The "surgical" operation takes place at or near the end of the girl's period of seclusion. "A piece of coconut shell is shaved very thin and a hole bored through. The glans clitoridis is drawn through this hole and cut off with a sharp knife or splinter of glass. It is believed that the operation has the effect of making the girl sterile. Notwithstanding this the women themselves are the chief supporters of the custom and resent any interference." The note also shows by reproductions of photographs the remarkable effect produced by eating vast quantities of fat-producing foods, including pounded yams cooked in palm oil.

ORGANISED VOLUNTARY CHILD WELFARE.

THE annual report of the Central Council for Infant and Child Welfare for the year ending April 1st, 1925, is a record of steady advance in many directions. In addition to its activities as a centre of information the work of the Central Council included the organisation, in conjunction with the British Red Cross Society, of a day nursery at the British Empire Exhibition at Wembley. This nursery proved a most successful piece of pioneer work, since during the time it was open it cared for no less than 11,091 children.

Another scarcely less important development during the year was the reorganisation and extension of the Travelling Exhibition, which has been in such demand that it was found necessary to collect a duplicate. Bookings were received for every month except April and December when the exhibitions were, for various reasons, not available. The educational value of these exhibitions can hardly be overestimated. In Blackburn 30,000 people visited it during the ten days it was on view, and the attendances at many other places were equally good. A permanent exhibition is now being collected at Carnegie House in response to a widely expressed desire, in which model exhibits of maternal and child welfare work will be on view daily to those interested free of charge. The exhibits included model garments for expectant mothers as well as for infants and children; a dental section, with diagrams showing the effect of diet on the development of the teeth; a clean milk section; a diet section; a rickets section, with exhibit from the Lister Institute of Preventive Medicine; a tuberculosis section; a cripple section; a chamber of horrors; posters, both English and American; an Indian section; and a model of a Red Cross child welfare centre.

A valuable innovation has been the provisional arrangement entered into with the College of Nursing, whereby the Library of Nursing is to be available to borrowers recommended by the Central Council, the Council contributing an annual sum to cover the extra cost of books purchased and the expense of administration. The scheme appears to be working well, and should enable students and infant welfare workers to obtain the best and most up-to-date publications on any branch of public health work.

Brief reports are given of the work of the federations of infant welfare centres throughout the country, as well as of the various constituent societies of the Central Council. In each case the record is one of progress and development.

INDEX TO "THE LANCET," VOL. I., 1925.

THE Index and Title-page to Vol. I., 1925, which was completed with the issue of June 27th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2.